July 2012

Revision 3a

2012 Catalog

MoTeC Systems USA

5355 Industrial Drive

Huntington Beach, CA
92649

1.800.845.7580

1.714.897.8782 fax

sales@motec.com

MoTeC

MoTeC Systems East

169-5 Gasoline Alley

Mooresville, NC 28117

1.704.799.3800

1.704.799.3874 fax

sales@moteceast.com

www.motecusa.com

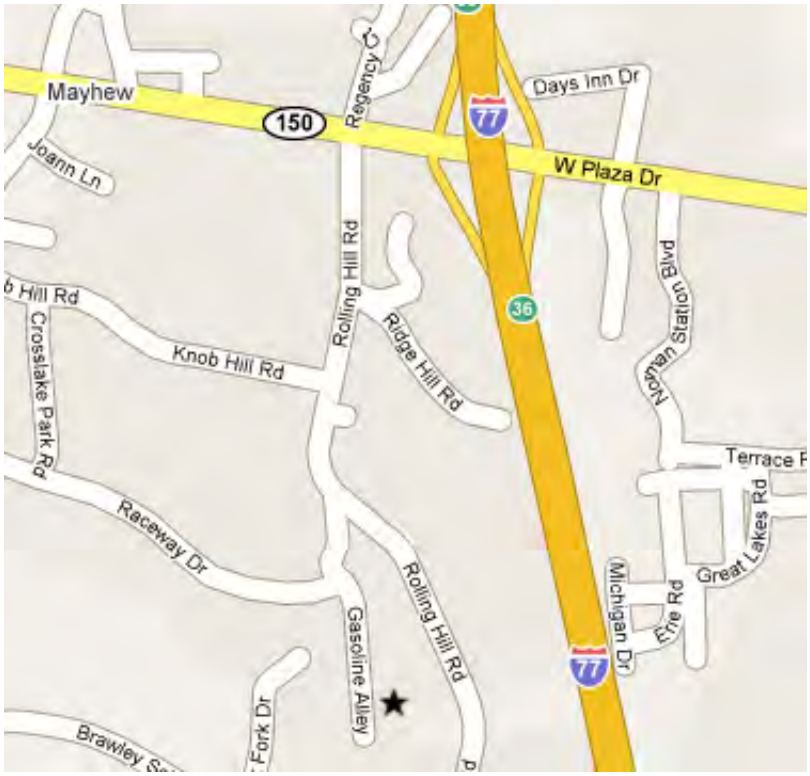
MoTeC Systems West

Optimal performance begins here. Stop by and see us in Huntington Beach, California. We've been providing the best in engine-management systems and support since 1985.

Business Hours:
Monday - Friday
8:30am - 5:00pm

MoTeC Systems East

169-5 Gasoline Alley
Mooresville, NC 28117
(704) 799-3800



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8:30am - 5:00pm

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MoTeC Steering Wheels

Made from 6061-T6 aluminum the MDD-SW housing is rugged enough to handle any motorsport use.

It communicates with the MoTeC ADL or M800 ECU via CAN.
The MDD-SW controls 12 LED outputs, and handles 12 switch inputs.
The Mini-Display-Dash currently fits the following models:

M MDD 12-1
Momo model 12

M MDD 27-1
Momo model 27

M MDD 29-1
Momo model 29

For options list and ordering please consult your MoTeC Representative

Laser Etched Graphics

You can order your MDD-SW completely customized with your team's logo or driver's signature on it. Our laser can also label buttons and controls so the driver never forgets what button to push.

Configurable LCD Read Out

The LCD display features adjustable brightness and contrast controls. In lap mode, it features a Gain/Loss bar graphic and switch to an "ADL display mode" to mimic the ADL dash display.

Pit Lane Speed Control

The Pit lane speed button latches on with one push. The top LED's switch from green to red, counting down your speed. When you're leaving the pits, push it once more to turn it off.

4-way Switches

You can choose a 4 way multiple switch to replace any of the buttons. This provides a variable voltage input device.

L.E.D. Lights

The MDD-SW features bi-color, high intensity LED's used for shift lights, warning lights, and pit lane speed.

Additional Buttons

The base MDD-SW comes with 4 buttons. You can add up 12 buttons, available in a multiple of colors and labels, to suit driver's preference.

Additional Models Coming Soon...

Driver Displays and Loggers

Sports Dash 3

The Sport Dash Logger (SDL3) comes standard as a combined display and powerful control device in one lightweight unit. With the addition of the Data Logging upgrades it becomes a fully programmable data logger with 16 or 120 MB memory.

It offers the same construction and advanced technology as the top of the line ADL3, with a package of features tailored to more moderate system requirements.

The display layout is fully configurable to show a multitude of data channels, warning alarms, lap times, fuel calculations, minimum corner speeds, maximum straight speeds and more.

Four auxiliary outputs are available to control external devices. With the use of an E888 expander, eight additional thermocouple outputs are available, making this versatile unit suitable for many applications.

M SDL3
Sport Dash 3

M SDL3 BL
Sport Dash 3 with Back Light Option**

Advanced Dash Logger (ADL3)

MoTeC's Advanced Dash Logger (ADL3) is a combined display, fully programmable data logger and powerful control device, all in one lightweight unit. It is a flexible, professional level system that is designed to grow with you as your requirements increase. As standard, the ADL3 comes with 16 MB of data logging, which can be upgraded to 250 MB at any time.

The ADL3's screen layout is fully configurable to display a multitude of data channels, warning alarms, lap times, fuel calculations, minimum corner speeds, maximum straight speeds and more.

Four auxiliary outputs can be used to control external devices with additional outputs available as an upgrade or created by using expander modules.

MoTeC's i2 data analysis software provides all the tools for comprehensive analysis of logged data, and a telemetry option is available for real time viewing of data while the vehicle is on the track.

M ADL3
MoTeC ADL3 Data Logger

M ADL3 BL
MoTeC ADL3 Data Logger with Back Light Option**

Driver Display & Logger Options/Upgrades

Sport Dash Upgrades

- Add an additional 16MB of Logging Memory
- Go from 16MB to 120MB of Logging Memory
- Pro Analysis

ADL3 Upgrades

- Add an additional 250MB of Logging Memory
- Add additional I/O for a total of 52 I/O
- Pro Analysis
- Remote Logging
- Telemetry

CDL3 Upgrades

- Add an additional 8 MB of Logging Memory
- 12 I/O Upgrade

** **Back Light Option must be stated at the time of purchase**

Driver Displays and Loggers con'd

Club Dash Logger 3 (CDL3)

The Club Dash Logger (CDL3) comes standard as a combined backlit display and powerful control device in one lightweight unit. With the addition of the Data Logging upgrade it becomes a fully programmable data logger with 8MB memory. It offers the same construction and advanced technology as the top of the line ADL3, with a package of features tailored to entry level motorsport requirements. The screen layout is fully configurable to display a multitude of data channels, warning alarms, lap times, fuel calculations, minimum
corner speeds, maximum straight speeds and more. The CDL3 performs calculations, acquiring data from other devices such as an ECU.

Features

- All-in-one display, logger* and controller*
- Suitable for bikes, cars, marine and industrial applications
- Compact, durable and reliable unit
- Supports Wideband Lambda from MoTeC PLMs or LTCs
- Easily integrates with MoTeC CAN-based expanders, GPS, shift lights and ECUs

Accessory Kit

Club Shift Light Module

CDL3 Wiring Loom

2 Button Loom

10Hz GPS

M CDL3 ACC KIT
CDL3 ACCESSORY KIT

Optional features

M CDL3 BL
Club Dash Logger Backlit

Inputs

- 4 x Analogue voltage high resolution inputs
- 2 x Analogue temperature inputs
- 2 x Digital inputs
- 3 x Speed inputs with voltage measuring capability
- Compatible with E888 expander (8 Thermocouples only)

Outputs

- 4 x PWM, switched or digital outputs Logging
- 8 MB logging memory
- Logging rates up to 500 samples per second
- Fast Ethernet download Additional Information

Compatibility

- MoTeC ECUs: M4, M48, M8, M84, M400, M600, M800 and M880
- MoTeC Accessories: MDD, E888, SLM, PLM, LTC, BR2, PDM, GPS, VCS etc.
- Many non-MoTeC devices

Additional Looms

M CDL3 OBDII ADP

A terminated OBD-II loom that connects the CDL3 kit loom to a vehicle's OBD-II port with no other wiring required.
CDL3 to OBD-II

M CDL3 MX00 ADP

This loom lets a user install the CDL3 kit into their M400/M600/M800/M84 equipped car without requiring custom wiring.
CDL3 to CAN ECU

M CDL3 M4 ADP

For users with RS232 based ECUs you can plug this loom into your D9 download cable, and the other into your CDL3 loom ECU connector to get data from your ECU.
CDL3 to RS232 ECU

M H CDL3 I/O EXP

When combined with the CDL3 I/O upgrade (M CDL3 12 I/O), this loom adds 6 Inputs to your CDL3 loom in a simple, easy to install fashion.
CDL3 I/O Loom

M CDL3 CURLY EXT

The terminated curly cord allows the CDL3 Kit buttons to be moved onto the steering wheel with ease.
Terminated Curly Cord

Driver Displays and Loggers con'd

ACL (Advanced Central Logger)

The ACL performs data logging, data communications and sophisticated calculations, as well as acquiring sensor data via the VIM expander modules. It also collects data from other connected devices such as MoTeC ADL2, SDL or ECU.

The ACL has a very large logging capacity (1GB+) with fast download via an Ethernet connection. It provides all the advanced features of MoTeC 's ADL2 Dash Logger, including warning alarms, fuel prediction, engine logs, timers, tables, user conditions, telemetry and more.

A remote display device such as MoTeC's MDD, ADL2 and SDL can also be connected, as well as the SLM (Shift Light Module)

M ACL
Advanced Central Logger w/Pro Analysis

ACL Upgrades

- Add Telemetry
- Add Remote Logging
- Add Pro Analysis

VIM (Versatile Input Module)

The VIM is a compact and versatile input expander module with high resolution inputs. Multiple VIMs may be connected to the ACL Central Logger via a two wire CAN connection, allowing for more than 200 sensor inputs. The distributed nature of the VIMs wired onto the CAN bus allows them to be located close to the connected sensors, minimizing wiring complexity and weight.
It has 24 Analog inputs of various types including eight differential inputs with programmable gain which are suitable for strain gauges and isolated thermocouples.

M VIM
Versitile Input Module

SVIM (Synchronous Versatile Input Module)

The new SVIM shares similar features with the VIM but is precisely synchronised, acquiring data of the highest integrity for use in advanced chassis and suspension analysis. It samples its eighteen 15 bit inputs at the same instant using 18 separate converters with fifth order anti-aliasing filters. The filters ensure that signals can be properly reconstructed to use in calculations such as FFT (Fast Fourier Transform).

M SVIM
Synchronous Versatile Input Module

Key:
✓ - standard available
× - not available
option - requires optional upgrade

Data Acquisition Comparison Table	SDL3	ADL3 / EDL3	ACL
Inputs			
Analogue voltage	8	10 optional 24	via VIM, SDL, E888, E816
Analogue temperature	4	4 optional 8	via SDL
Digital	2	4	via VIM, SDL, E888, E816
Speed	2	4	via VIM, SDL
Switch	×	4	via SDL, E888, E816
Wideband Lambda	via PLM or LTC	via PLM or LTC	via PLM or LTC
Expansion units	E888; 8 thermocouples only	up to 2 x VIM and 2 x E888/E816	up to 8 x VIM and 2 x E888/E816
Data acquisition and telemetry			
Data logging memory	optional 8 MB or 120 MB	16 MB optional 250 MB	1 GB
Logging rate	1 - 500 Hz	1 - 1000 Hz	1 - 5000 Hz
Analysis using **i2 Standard**	option	✓	✓
Analysis using **i2 Pro**	option	option	✓
Telemetry	×	option	option
Remote logging	×	option	option
Display			
Reflective LCD	✓	✓ on ADL3 × on EDL3	via SDL, MDD
Backlight	option	option on ADL3 × on EDL3	via SDL, MDD
Display modes	3	3 on ADL3 × on EDL3	3 via SDL
Communications			
CAN	2	2	2
RS232	✓	✓	✓
RS422, RS485	×	×	✓
PC connection			
Ethernet	✓	✓	✓
Outputs			
Digital, Switched, PWM	4	4 optional 8	via E888, E816
Expansion units	×	1 or 2 x E888/E816	1 or 2 x E888/E816
	SDL3	**ADL3 / EDL3**	**ACL**

Professional Lambda Meter

The MoTeC Professional Lambda Meter (PLM) determines exhaust gas mixture strength over a wide range of conditions with a fast response time. Quick and easy to use, it allows a calibration engineer all the power and configurability required for OE emissions development and certification work.

The MoTeC PLM provides a differential analog-voltage output that connects to an analog meter or measurement instrument such as data logger or chart recorder. Define output as linear or non-linear in relation to the measured units. The PLM also supports 1mbit CAN and RS232 data links to devices such as the MoTeC dash/logger for transmission of sensor and diagnostic data. Comprehensive diagnostic, status channels are provided for.

The PLM can be used as Lambda input for an ECU!. Instead of purchasing the Lambda Upgrade on M4/M48 - the PLM's definable output voltage can be used as the input for Lambda on these ECU's. This gives you the use of a more state of the art sensor with a digital display which you can place on your dashboard for viewing even if the ECU is offline. Of course you can then use this lambda meter on any other car you wish.

Specifications:

- Weighs135 gms
- Robust aluminum enclosure
- Operating range 0.70 and 32.0 lambda (for gasoline/petrol this equals air/fuel ratio range of 10.3:1 to 470:1)
- Display lambda, air/fuel ratio, or oxygen percentage for any sensor-compatible fuel
- Define display resolution (in decimal points), update rate, filtering, backlight intensity
- Easy Air calibration using PLM Software (no twisting of screws or watching LED's required)

M PLM
Professional Lambda Meter

Kits come with Sensor, Harness, Software, O2 Bung, Comm Cable and Users Manual

Professional lambda meter with Bosch LSU lambda sensor or NTK Pro Uego lambda sensor.

Professional Lambda Meter Accessories

M PLM CIG
Cigar Lighter Adapter
Allows you to power the PLM from a car cigar lighter - great for in-car tuning.

TR-18 PLUG
18mm X 1.5mm threaded stainless bung, with copper washer.

TR-18-13
18mm SS Ring for LSU Sensor.

TR-18 SS
Oxy Sensor Ring 304L Stainless

M PLM SUCT CUP **M PLM MOUNT**
Use the PLM Suction Cup with the PLM Universal Mounting Kit to mount your PLM to your windshield.

M PLM EXT
PLM Extension Cable
Connects between PLM and Serial Port on PC.
Adds 20 feet of length between PLM and existing harness connector
Used to lengthen any PLM Harness regardless of sensor type. Rugged design is impervious to oil - excellent for dyno rooms and boats.

MoTeC Mini Display Dash

M MDD-1
Mini Dash Display

The display is a DOT Matrix backlit graphics LCD which allows the MDD to support a number of different display layouts to suit various applications. The MDD is small enough to be mounted on the steering wheel or it may be mounted in a more traditional location using 2 sided tape or Velcro. The MDD and its outputs are fully controllable when the MDD is used in conjunction with the ADL. When used with an ECU, the MDD features predefined display screens. A Switched input to the MDD allows the user to toggle through the different display screens on the MDD.

- Weighs120 gms (1/4 pound)
- Robust aluminum enclosure
- W X L X H = 3.38 X 2.34 X .86 inches
- Max Current Requirement 150mA @14volts
- For use with ADL Dash Logger or with a MoTeC ECU
- Receives data via serial or CAN bus

Option - Integrated Switch Assembly

Expansion Boxes

M E888

E888 and E816 add additional I/O to your system. They talk to the Dash over the CAN bus so only 2 wires must be routed to the dash from either the E888 or E816. Each device features its own 0v and 5v references to monitor its own sensor inputs.

E888 contains:

- 8 Thermocouple inputs
- 8 Analog Voltage inputs
- 4 Digital Inputs
- 2 Switched Inputs
- 2 Cold Junction Compensation Inputs
- 8 PWM Outputs

M E816

E816 Contains:

- 16 Analog Voltage Inputs
- 4 Digital Inputs
- 2 Switch Inputs
- 2 Thermistor Inputs
- 8 PWM Outputs

MoTeC Mitsubishi Diff Controller

The Mitsubishi Diff Controller (MDC) is a direct replacement for the Active Centre Diff (ACD) controller for the EVO 7, 8 and 9 models. The MDC is a fully programmable centre diff controller. Six different diff control mode are selectable from the standard ACD button located on the dash board. The modes include 0% and 100% lock and four user programmable modes. The MDC can be used on vehicles fitted with Active Yaw Control (AYC) but the AYC will be disabled.

M MDC
Mitsubishi Diff Controller

MoTeC Ignition Expander

The MoTeC Ignition Expander enhances the ignition control capability of any MoTeC ECU . The MoTeC IEX will allow a single MoTeC ECU output to control up to 8 individual coil drivers.

M IGN EX

MoTeC Traction Control Multiplexer

The MoTeC Traction Control Multiplexer goes between the ECU and the wheel speed sensors It gathers the speed information from the 4 wheels and calculates the ground speed from the fastest rolling wheel and speed difference from the driven wheels. The MoTeC Traction Control Multiplexer is very useful in allowing 4 separate speed channels to be brought into one input of the ECU

M TC MUX

Did You Know?

The MoTeC ECU software will not let you perform an ignition test while using the ignition expander. However you can easily make a jumper and change the ignition setup in the software to 1 coil. Then you can go into the ignition test screen, and use the jumper on the harness at the Expander connector (Expander unplugged) and test each coil Output.

IGN EX / TC MUX Harness Spares MoTeC Traction Control Multiplexer

M ECONO 18
18-way plug set for M IGN EX and M TC MUX

MoTeC ECU's

M84

M400

M600

M820

M880

MoTeC ECU Comparison Chart

These are the main specifications of the MoTeC ECU range to compare the suitability of the different models for your application.

✓ standard available

× not available

option - requires optional upgrade

ECU Comparison Table	M2R	MLS	M4	M48	M84	M400	M600	M800	M880
Number of cylinders									
Sequential	up to 4	up to 4	up to 4	up to 8	up to 8	up to 4	up to 6	up to 8 opt 12	up to 8 opt 12
Group fire mode	up to 12	up to 12	up to 12	up to 12	up to 8	up to 4	up to 6	up to 12	up to 12
Rotary	2	2	2	2	2,3,4	2	2,3	2,3,4	2,3,4
Outputs									
Injector outputs	4	4	4	8	8	4	6	8*	8*
Ignition outputs	up to 4*	up to 4*	up to 4*	up to 2*	6	4	6	6*	6*
Auxiliary outputs	up to 4*	up to 4*	up to 4*	up to 4*	8	8	8	8	8
Option to use spare outputs as auxiliary outputs	×	×	×	×	×	×	×	✓	✓
Individual cylinder tables	option	option	option	×	×	✓	✓	✓	✓
Inputs									
Trigger inputs (Ref/Sync)	2	2	2	2	2	2	2	2	2
Analogue voltage inputs	3	3	3	3	8	8	8	8	8
Analogue temperature inputs	3	3	3	3	3	6	6	6	6
Digital/speed inputs	2	2	2	2	4	4	4	4	4
Wideband Lambda inputs (option)	4-wire (option)	4-wire (option)	4-wire (option)	4-wire (option)	2 x 5-wire (single included, dual option)	1 x 5-wire (option)	2 x 5-wire (option)	2 x 5-wire (option)	2 x 5-wire (option)
Communication									
RS232	✓	✓	✓	✓	✓	✓	✓	✓	✓
CAN	×	×	×	×	✓	✓	✓	✓	✓
Data acquisition and telemetry									
Data logging (option)	512 kB	512 kB	512 kB	512 kB	512 kB included	512 kB	512 kB	1 MB	1 or 4 MB
Maximum logging rate	20 Hz	20 Hz	20 Hz	20 Hz	100 Hz	200 Hz	200 Hz	200 Hz	200 Hz
Track mapping	×	×	×	×	✓	✓	✓	✓	✓
Data analysis using **i2 Pro**	×	×	×	×	×	option	option	option	option
Telemetry	option	option	option	option	×	×	×	option	option
Remote logging	option	option	option	option	×	×	×	option	option
Functions and features									
Boost control	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nitrous Injection	✓	✓	✓	✓	✓	✓	✓	✓	✓
Dual stage injection (Hi/Lo injection)	✓	✓	✓	✓	option	✓	✓	✓	✓
Ground speed limiting	option	option	option	option	✓	✓	✓	✓	✓
Traction and launch control	option	option	option	option	option	option	option	option	✓
Overrun boost enhancement (anti-lag)	option	option	option	option	option	option	option	option	✓
Gear change ignition cut (flat shifts)	option	option	option	option	option	option	option	option	✓
Stepper motor idle control	×	×	×	×	✓	✓	✓	✓	✓
Continuously variable camshaft control	×	×	×	×	×	option	option	option	option
Drive by wire throttle control	×	×	×	×	×	option	option	option	option
Servo motor control	×	×	×	×	×	×	×	option	option

MoTeC M800 Plug & Play ECU (OEM)

Also available amongst MoTeC's wide range of engine management options are the discreet M800 Plug & Play systems.

These ECUs are designed as plug in boards to replace the OEM computers in a number of high performance late model vehicles. These units provide the flexibility and performance of a MoTeC M800 ECU without the necessity of rewiring the car or building adapter looms. M800 Plug & Play ECUs are built with the same options as a standard M800, though there are some limitations due to factory plug designs. To assist with the tuning of your vehicle they can also be supplied with a start up engine map.

Currently available are:

M800-EVO 4-8 - M800 OEM ECU FOR EVO 4-8
M800-EVO8GSR - M800 OEM ECU FOR EVO EVO8GSR
M800-EVO9 - M800 OEM ECU FOR EVO 4-7 AND EVO9
M800-WRX7 - M800 OEM ECU FOR WRX7
M800-WRX9 - M800 OEM FOR WRX V9/10
M800-EVO X- M800 OEM ECU FOR EVO X

MoTeC ECU Options

✓ = Available

Description	OEM	M2R	MLS	M4	M48	M84	M400	M600	M820	M880
512K DATALOG M400/M600							✓	✓		
ENABLE 1 MEG INT LOGGING	✓								✓	✓
ADD 3 MEG INT LOGGING										✓
ENABLE SINGLE WIDE LAMBDA	✓	✓	✓	✓	✓		✓	✓	✓	✓
ENABLE UPGD SNGL TO DUAL LAM	✓					✓		✓	✓	✓
ENABLE DUAL WIDE LAMBDA	✓							✓	✓	✓
ENABLE ADVANCED FUNCTIONS	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
ENABLE ACTIVE CAM CONTROL	✓						✓	✓	✓	✓
ENABLE DRIVE BY WIRE							✓	✓	✓	✓
ENABLE OVERRUN BOOST	✓					✓	✓	✓	✓	✓
EN 10/12 CYL OPERATION									✓	✓
ENABLE MULTIPULSE FUNCTIONS									✓	✓
ENABLE PRO ANALYSIS	✓								✓	✓
ENABLE REMOTE LOGGING									✓	✓
ENABLE DC SERVO OPERATION									✓	✓
ENABLE TELEMETRY OUTPUT									✓	✓
ENABLE GEAR CHANGE IGNITION CUT						✓				
ENABLE HI-LO INJECTION						✓				
ENABLE TRACTION CONTROL						✓				

MoTeC Beacon Transmitter and Receiver

Transmitters and receivers offer 1,000 different codes, to avoid conflicts with competitors' beacons.
To change channels on the transmitter, simply open the cover by removing the screws and adjust the dip switch inside to the desired channel. The BR-2 can be configured using the Dash Manager software and the Beacon Configuration Utility which comes with Dash Manager.

M ADL BRX-2
Beacon Reciever 2 - Autosport microterm connector
CAN capable with increased accuracy

M ADL BTX
1,000-channel IR beacon transmitter
Includes cable, angle bracket for 1/4² camera mount.
Transmitter sets up on the track.

MoTeC ADL Hardware

Billet Shift / Warning Indicator

CAN based Shift Light Modules. Each LED is fully independent as to the purpose and the same light can be used for multiple functions.

M SLM
With a flat base

M SLM USA
With an angled base

Acceleration/Yaw

M ADXL-1
Accelerom. 4G, one axis, with DTM connection

M YAW 100

M YAW 200

Video

VCS Video Capture System

MoTeC's VCS Video Capture System is an integrated in-car camera system, designed for race cars and other harsh environments. The VCS is supplied as a kit (see next page) with either a 4 GB or 16 GB high performance flash card.

Features:

- Solid state digital recorder
- MPEG-2 video compression format at broadcast quality
- Configurable two camera PIP - Picture In Picture - system (second camera optional)
- Uses 12 V vehicle power - no recharging
- CAN interface for easy connection to MoTeC Data Loggers and ECUs
- Video can be linked to logged data using MoTeC's i2 Pro Data analysis software*
- Footage can be automatically synchronised to the logged data using the VSM (optional)
- Programmable Auto Start/Stop Recording using any transmitted channel
- Gauges are recorded live on the video
- Fast USB2 download - no bent card pins
- Customisable screen layout

M VCS
With 4GB memory card

M VCS 16
With 16GB memory card

Kit Includes

Recorder
- VCS Pro Recorder, 4 GB card or
- VCS Pro Recorder, 16 GB card

Camera and Microphone
- Camera
- Microphone

Looms and Cable
- Mini-USB B to USB A Male Cable
- VCS Adapter Loom
- VCS Power / CAN Loom

Mounts
- Roll Cage Mounting Bracket
- VCS Mounting Plate

VSM – Video Sync Module

MoTeC's Video Capture System (VCS) is an integrated in-car camera system, designed and built for race cars and harsh environments.

The VCS records video and audio using the MPEG-2 video compression format at broadcast quality. It includes a built in real-time graphics processor that allows sensor data to be overlaid onto the video in real-time without the need for additional hardware.

The CAN interface enables communication with other devices, for example to set Auto Start/Stop Recording conditions.

The Video Capture System is supplied as a kit with either a 4 GB or a 16 GB high performance flash card. The kit includes:

- VCS Pro Recorder
- Camera
- Microphone
- Mini-USB B to USB A Male Cable
- VCS Adapter Loom
- VCS Power / CAN Loom
- Roll Cage Mounting Bracket
- VCS Mounting Plate

M VSM
Video Sync Module

On Screen Display

The video may have the following data overlaid if the required sensors are installed in the vehicle:

- Throttle Position: displayed as a vertical green bar graph scaled between 0% and 100%
- Ground Speed: displayed as a gauge from 0 to 300 kph with overlaid numeric value
- RPM: displayed as a gauge from 0 to 9000 rpm with overlaid text value
- G force: displayed as a G circle from 0 to 2G with an indicator point and an overlaid text value for lateral and longitudinal G
- Brake Switch: displayed as a vertical red bar graph
- Gear: displayed numeric in the centre
- Lap number, Lap time, Last lap time: displayed numeric
- Steering: displayed as a steering wheel

GPS Receivers

RaceGrade GPS

This GPS device is based on a GPS engine from Hemisphere GPS. It provides a true non-interpolated 10 Hz or 20 Hz output enclosed in a motorsport aluminum case. Serial output conforms to NMEA standard RS-232 protocol at 57600 baud rate. There is also a speed output pulse for applications that don't accept serial data. This item is replacing the Real Time Clock with GPS addon.

M GPS BL

Specifications	
12-channel GPS engine.	
Horizontal accuracy < 1 meter at 95%	
57600 baud serial, other rates available upon request	
NMEA standard $GPGGA and $GPRMC data	
Digital output pulse	0-5v 50% duty cycle
Power Requirements	
Supply Voltage	6 to 18 VDC
Current Consumption	380 mA at 12v
Environmental	
Temperature Range	-30° to 70° C
Dimensions	3.95 in x 2.7 in x 0.9 in
	100 mm x 69 mm x 23 mm
Weight:	157 grams w/o angtenna

MoTeC GPS

The GPS-L5 (5 Hz) and GPS-L10 (10 Hz) combine both, the electronics and antenna, into one small unit. A highly sensitive receiver allows the GPS to lock onto signals even in difficult environments. Both are fitted with a DTM connectors. The GPS-L5 is pre-configured to be compatible with MoTeC 'Hundred Series' and M84 ECUs. The GPS-L10 is pre-configured to be compatible with MoTeC Dash/Data Loggers. It is not compatible with MoTeC ECUs.

M GPS-L5
5 Hz GPS

M GPS-L10
10 Hz GPS

Electrical	
Power Supply Voltage	4.0 to 6.0 V
Power Supply Current	38 mA Typical
Connections	
Mating Connector	Deutsch DTM06-04S
Current Consumption	100 mA at 5.0v

Pin	Name	Description
1	Bat-	Connect To Battery Negative on the logging Device
2	TX	Connect to RX pin on logging device
3	RX	Don't connect (this pin is only used for programming)
4	5V	Connect to 5 V sensor supply on the logging device

Data	
Output Type	RS232
Output Levels	-5 V / 5 V (nominal)
Baud Rate GPS-L5	19200 (MoTeC default)
Baud Rate GPS-L10	38400 (MoTeC default)
NMEA Sentences	RMC, GGA (MoTeC default)
Physical	
Antenna	Built into GPS unit
Size	48 mm x 41 mm x 14 mm (1.9" x 1.6" x 0.55")
Weight	106 grams (3.8 oz)
Cable length	3 m (10 ft)
Operating Temperature	-30 °C to +80 °C (-22 °F to +176 °F)
Mounting	Magnetic base
GPS Performance	
Update Rate	5 Hz (GPS-L5), 10 Hz (GPS-L10)
Satellite Channels	66
Reacquisition Time	< 1 second
Hot Start Time	2 seconds
Warm Start Time	33 seconds
Cold Start Time	35 seconds
Dynamics	4G

Capacitive-Discharge Ignitions

For Single and Dual coil CDI applications using conventional distributed spark or for Rotary applications, We recommend our proven single and dual channel CDI boxes. Over 100 millijoules of energy is available per spark and the hardware is produced to hang tough under this kind of operating condition in a racing environment.

M CDI-1 M&W

M CDI-2 M&W

M CDI-4 M&W

M CDI-8

The MoTeC CDI-8 answers the call for world-class ignition capability in a compact, rugged package. Designed to drive up to eight low-impedance CDI coils. The CDI-8 can operate in ECU slave mode or in stand-alone mode with Windows spark-mapping software.

The CDI-8 boast features like Autosport connectors and CAN-based diagnostics.

Reliable, refined circuitry can deliver full 450-volt primary voltage at 15,000 revs (30,000 RPM for 4 cyl). Output stages can deliver up to 200 amps into a CDI coil primary without damage. CDI links into the vehicle network CAN bus to provide instant diagnostic messaging. Simply the best CDI available anywhere. CDI-8 has been proven on engines producing more than 3000 Horsepower.

Capacitive-Discharge Ignitions Accessories

Capacitive-Discharge Coils

M CDI 551 101
Single Ended CDI coil

M CDI 551 102
Double Ended CDI coil

M CDI 832757A4
Single Ended CDI
Highest Output on the Market

CDI-8 Wiring

M CDI-8H
10´ unterminated harness
with Autosport connector

Multi Coil Inductive

M 6-D846251
Mitsu 6-cyl coil pack
6-cyl wasted spark

M 4-2100
4-cyl coil pack
w/integral ignitors
(ECU controlled only)

Coil-Near Plug Inductive

M DEN-580
Coil-near plug w/integral ignitor

M DEN 580 WIRE
Denso 580 production spark plug wire

M DEN 580 TERM
Termination kit

Custom made Spark Plug Wires available

Denso Termination

M 12-2254
Straight coil-end boot

M 12-2977
Coil-end termination

M 12-3659
45º coil-end boot

M 015561
7mm Spark Plug Wire

M 12-2220
90º coil-end boot

Like Thunder and Lightning

The Denso 580 Coil Near Plug features a built in Ignitor making them an excellent choice for ignition because they eliminate the need for an external ignitor between the ECU or Ignition Expander and the coil. Do they have a good spark? We have had success using them to ignite the spark under 20 PSI boost on some 2000 Hp Engines!

M 12-2264
Straight Spark Plug Boots

Multi-Channel Ignitors

1. M 0227 124 D
Bosch 1-channel ignitor

1

2. M 0227 200
Bosch 2-channel ignitor

2

3. M 0227 203
Bosch 3-channel ignitor

3

4. M 0227 211
Bosch 4-channel ignitor

4

Why Do I need an Ignitor - what do they do?

An ignitor is an amplifier that converts a low current signal into a high current signal. In this case the coil trigger signal coming from the ECU is low current. The ignitor uses this low current signal to trigger the coil itself which requires high current.

Why doesnt the MoTeC have a built in ignitor?

Since the part that actually triggers the coils ia a high current device, it gets extremely hot during normal operation. That heat when placed in close proximity to the sophisticated microprocessor controlling your engine can cause it to degrade over time. Also, should the ignitor ever fail - it can be easily accessed for replacement - no need to send the ECU in for repair. Lastly, without the constraints of a built in ignitor MoTeC gives you the freedom to trigger any type of ignition system making integration with your existing hardware as seamless as possible.

Power Supply

Power Distribution Modules

MoTeC PDMs are designed to replace conventional relays, fuses and circuit breakers by providing electronically switched power to the various electronical systems in the vehicle, including motors, lights, solenoids and electronic devices such as ECUs and data systems. It also provides full diagnostic information, including output currents and voltages, and error status that can be monitored on a PC or transmitted via CAN to a display or logging device. Each output is overcurrent, short circuit and thermal overload protected. Outputs are programmable in 1 Amp steps and controllable via a combination of switch inputs, CAN messages and logic functions.

PDM15

PDM30

PDM16

PDM32

	M PDM15	M PDM30	M PDM16	M PDM32
Outputs				
Number of 20 Amp Outputs	8	8	8	8
Number of 8 Amp Outputs	7	22	8	24
Inputs				
Number of Inputs	16	16	12	23

Dual Half Bridge (DHB)

The Dual Half Bridge (DHB) is a high current amplifier which allows low current auxiliary outputs to drive high current loads such as motors. It contains two high current half bridge outputs enabling it to drive a single motor in two directions, or drive two motors in a single direction. It is also capable of high speed PWM, which can be used for speed control of motors and for other purposes.

The DHB connects to any auxiliary output of a MoTeC ECU or Dash Logger, which performs the control function, such as PWM speed control, direction control or servo control.

The fully sealed case makes the DHB suitable for under bonnet mounting.

Application Examples

- Servo motor e.g. active wing control, boat trim control, inlet runner length control, variable valve lift.
- Motor speed control e.g. electric water pump, thermo fan, fuel pump.
- Solenoid control.

Compatible with

- All MoTeC ECUs
- All MoTeC Dash Loggers

M DHB
Dual Half Bridge

Fluid Level Sensor

Electronic Sending Unit For Fuel, Oil, and Potable Water

Fluid level sensor.
Length = 14-inches.
Output Voltage = 0-5 volts.

M P155-CGO-14

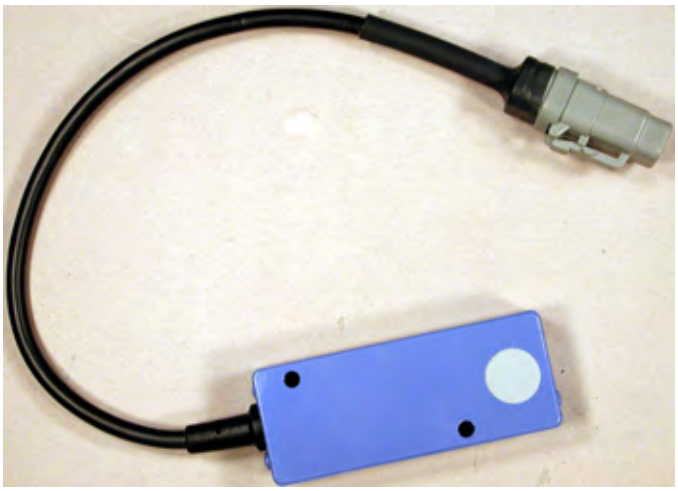
String Potentiometers

ADL String Potentiometers. Ring loop on end of cable makes attaching easy. Especially well suited to throttle or other pedal or lever position. Can easily be wrapped around a steering shaft to give steering angle.

M ADL SPOT 10

Ride Height Sensors

Ultrasonic Ride Height Sensors. Reads range from 1 inch to 10 inches. Alternative to Lasers



M ADL RHS
Ultrasonic Sensor with DTM

Laser Sensors Available - Call Us

Steering-Wheel Switch Assembly

Sport Dash and ADL steering-wheel switches.
For alarm-acknowledge, scrolling alphanumeric display, and ADL mode. Terminates w/ 6-pin DTM

M SD SW H

M ADL SW H

MS Switches

1. M SW-4JOY
4-position joystick
Use for mode selection/alarm

2. M SW 1TL1-1
Centered SPDT nonlock

3. M SW 1TL1-1A
SPDT centered

1

2

3

4. M SW 1NT1-2
SPST one-pole on-off

5. M SW 1NL1-2D
SPST, both positions lockout

6. M SW 1NT1-3F
SPST, one-position lockout

4

5

6

7. M SW 1NT1-6
SPST momentary

8. M SW 1NT1-7
SPDT centered momentary. Common for switching dash modes, paging through display & alarm acknowledgment

9. M SW 4NT1-12A
DPDT, 3 positions lockout

7

8

9

Silicone Switch Covers

M SW N1030-2501
Grey

M SW N1030-2503
Yellow

M SW N1030-2508
Red

Emergency Switches

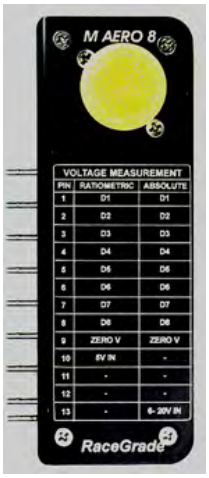
3097
Emergency Fire Master Shutoff Switch

Linear Position Sensors

Standard termination is with DTM connectors

Call for pricing on Autosport termination.

Aerodynamics



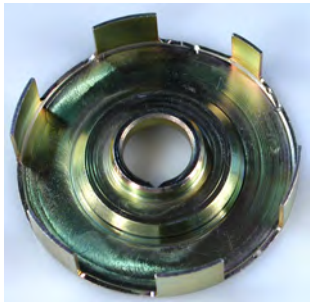
M AERO 8
8 Channel Aero Sensor

M AERO PITOT
Pitot Tube Asssembly

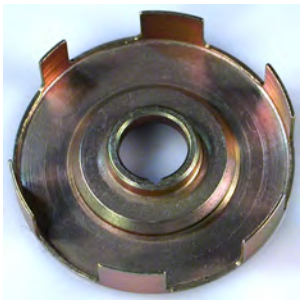
M AERO 42
4 Channel Aero Sensor

Engine Hardware

Trigger Wheels



M PCHOP CW
Porsche Narrow-tooth distributor chopper wheel, 6 cylinder Clockwise



M PCHOP CCW
Porsche Narrow-tooth distributor chopper wheel, 6 cylinder Counterclockwise

Dual Magnetic Converter (DMC)

Magnetic Sensor Amplifiers

The Dual Magnetic Converter (DMC) converts magnetic style signals to open collector output signals – a square wave. This makes a typical magnetic sensor behave as a switched or Hall Effect sensor, to make the signals suitable for use with MoTeC ECUs and loggers.
This allows magnetic sensors to be used in applications where previously a Hall sensor was required, for example when using the digital inputs on an ECU to measure wheel speed.
A single DMC can convert two independent magnetic sensor signals.
The DMC comes in 4 versions, each having different trigger levels according to the requirements of the intended application.

- **DMC A**

This version is intended for fuel flow sensors which have a very low trigger level.
Heavy filtering minimises the possibility of interference, resulting in significant variation of the trigger level with frequency.

- **DMC B**

This version is intended for engine trigger sensors that have insufficient amplitude to trigger a logic level input.
Minimal filtering avoids delays in the signal. The trigger level does not vary significantly at normal operating frequencies.

- **DMC C**

This version is intended for ignition system input conditioners, typically used in drag racing, for measuring ignition timing.

- **DMC D**

This version is intended for magnetic wheel speed sensors.
The signal should be symmetrical around zero volts.
Heavy filtering minimises the possibility of interference, resulting in significant variation of the trigger level with frequency.

M DMC A

M DMC B

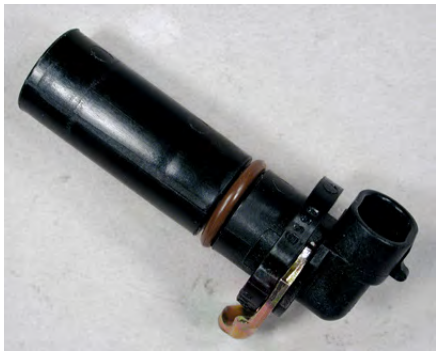
M DMC C

M DMC D

Sensors

Crank/Cam Trigger

M 3025 SS13
Crank, 3/8² smooth mag sensor



M 6-BAC-AD8
Crank angle, GM mag sensor

M 4-APX-001
Crank, 3/8² threaded mag sensor

M 6-APX-003
Crank/cam, 5/8² threaded mag sensor

M MHALL 437
Crank/Cam, magnet operated

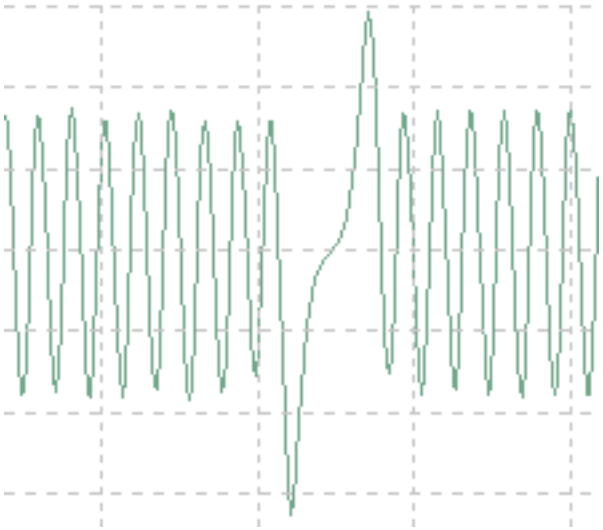
M MHALL MAG ASB
Samarium/cobalt magnet, 1/4 thd carrier

M MHALL MAG
Samarium/cobalt .115” diameter (white side is south pole)

Mag Sensor Polarity

When using a magnetic sensor, the waveform produced by the sensor can be changed by reversing the polarity of the wires from the sensor. For your convenience, MoTeC sensors come pre-wired with a falling edge waveform. See page 40 for more details.

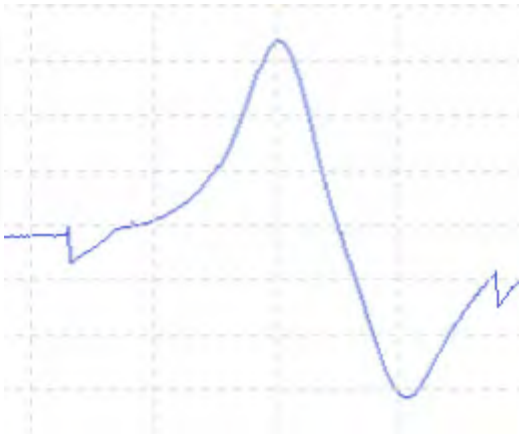
Rising or Falling edge?



To know for sure if you sensor produces a rising or a falling edge you need a Digital Volt/Ohm Meter or DVOM. Disconnect the ECU from the Harness. Plug the red lead of the meter into the signal terminal of the ECU Header and the black lead to the 0v terminal. Place a steel object (like a screwdriver) against the sensor. Set the DVOM to read DC volts. Quickly remove the metal from the sensor and watch the direction the voltage goes either positive or negative. If the voltage goes negative, the sensor is wired as a falling edge sensor. If the voltage goes positive, the sensor is wired as a rising edge signal.

Missing Tooth / Mag Sensor Falling Edge Polarity

When viewing the waveform on a labscope, the direction of travel of the voltage line as it crosses the 0v line determines the sensors active edge. This edge will not deviate in time with respect to RPM. The opposite edge will. This corresponds to the point at which the trigger tooth passes the center of the sensor.



Mag Sensor Rising Edge Polarity

Pole Diameter

It is important to remember when designing a trigger wheel with a mag sensor, that the width of the tooth in degrees should be no less than 1 times the width of the pole piece in degrees and no more than 2 times this number of degrees. Some mag sensors have a stainless steel shield on them making it difficult to see the true pole diameter. Rub the sensor in some steel shavings to give you an idea of the pole piece size.

Fuel Delivery

All pump flow values are measured at 5 bar line pressure with a 14vdc supply

M GFP 044
Bosch fuel pump, 220 lbs/hr

Pump Inlet fittings for 044 (to 18mm)
M 10AN-18CU

M 8AN-18CU

Pump Outlet fittings for 044, 046
M 6AN-12CU

How big of a Pump do I need?

In basic terms the amount of fuel you require to properly feed your engine depends on how much power you intend to produce and what rail pressure you wish to run. Typically a gasoline engine will require .5 lbs of fuel per hour for every 1 horsepower produced. If you have a 1000 horsepower engine and you intend to run 60 PSI of injection rail pressure, you will need a pump capable of delivering 500 lbs/hr at 60 PSI. Remember that a pump capable of delivering 2000 lbs/hr free flowing is worthless unless it can deliver the proper amount of flow at the pressure you want to run. Typically increasing pressure decreases a pump's volume output.

Regulator Fittings

Adjuster for Bosch
motorsport regulators
M 4AN-8MM

Conversion: metric to AN -6 Converts
STD metric regulator ends to AN lines
M 6AN-12MM
M 6AN-14MM
M 6AN-16MM
M 8AN-14MM

Return line fittings
Hose barb-AN line
M 6AN-16MM BULK

Controls

Air Control Valves

M 0280 512
Bosch 2 Wire

Trim Switches

M DS-12
Mini Dashboard Mounted Trim Switch, steps 1 to 12-positions, user adjustable.

M DSM-4
Mini four position MAP Switch for M800 series running firmware v3.3 or higher.

M DS-11
Dashboard mounted Trim Switch, steps 1 to 11-positions, user adjustable.

Boost Control has never been easier

The MoTeC ECU's offer unparalleled levels of boost control. In addition to having feedback type wastegate control, various inputs can be used to regulate boost for certain parameters. For example, when using a wheelspeed input, MoTeC allows boost based on wheelspeed and rpm - or boost based on gear position and rpm. A multiposition trim switch input can be used to allow the driver to manually select the desired boost level on the fly.

How can I use a Trim Switch?

The multiposition trim switch can be used in a number of ways. It is most commonly used to trim fuel or ignition but can also be used to trim boost if the wastegate is ECU controlled or can be used to select 1 of 9 or 11 different RPM limit levels on the fly without a laptop. Ask your MoTeC representative how you can use a trim switch in your application.

Wheel Speed

M DHALL 437
Wheel speed, 7/16² threaded hall sensor,
ferrous-tooth operated with DTM termination.

M GT101DC
GT101 Hall effect wheelspeeed
ferrous-tooth operated

Calibrating Wheel Speeds

In order to properly calibrate the wheelspeed sensor in the ECU you must know the circumference of the tire. According to Geometry the circumference is equal to the diameter of the tire multiplied by Pi (3.14159). Unfortunately, your tire diameter will change when it is supporting the weight of the car. So the best way to get the tire circumference is to mark the tire and the ground, and then push the car until the mark on the tire is again back on the ground. Then measure the linear distance between the two marks. You can then divide this measurement into the distance you are calibrating for (1 mile = 5280 ft). The result is the number of tire revs per mile or KM. Then we have to multiply this number by the number of teeth on the trigger wheel. Finally, the total is divided by 10 to arrive at the calibration value. Circumference = 8.3 feet 5280/8.3 = 636 Number of teeth = 4 so 636(4) = 2544/10 = 254.4 Calibration value is 254.4

Manifold Pressure Sensors

M EPT 75A
Pressure transducer, 500 kPa (60 PSI boost)

M 16-7039
Pressure sensor, 100 kPa

M 16-6835
Barometric Pressure sensor, 108 kPa

M 16-9886
Pressure sensor, 200 kPa (15 PSI boost)

M 16-0749
Pressure sensor, 300 kPa (30 PSI boost)

M 16-4360
1 Bar MAP/MAT Sensor

M 16-8191
3.5 Bar MAP/MAT Sensor

M 12-5525K

Mating connector kit for both the 1 Bar MAP/MAT Sensor and 3.5 Bar MAP/MAT Sensor

How to Calibrate a Pressure Transducer

The Pressure Transducer which MoTeC offers for measuring pressure all output signal voltages beginning at .5 volts and ending at 4.5 volts. The range of the sensor is relateable to the AtoD counts in an ECU in the following way. At the bottom of the range, the sensor outputs .5 volts which is equivalent to 102 counts. At the top of the sensor's range, it outputs 4.5 volts or about 922 counts. If you interpolate the calibration table between these two points, you will have the correct calibration for the sensor - no matter what the range is.

MoTeC Sensors

Pressure Sensors

M EPT 100G
Pressure transducer, 100 PSIG

M EPT 150G
Pressure transducer, 150 PSIG

M EPT 300G
Pressure transducer, 300 PSIG

M EPT 1000G
Pressure transducer, 1000 PSIG

M EPT 2000S
Pressure transducer, 2000 PSIG

M EPT 3000S
Pressure transducer, 3000 PSI

M P155 2230
8-bar(0-120 PSIG) GM

Pressure-Sensor Unions

M 3-983203/5924
3ANto-3AN bulkhead union

M 3-981503
3AN-to-3AN coupler

M 3-981603
3AN-male-to-1/8"NPT-male coupler
Requires O-ring to mate with Kavlico sensor

M 3-991902
Dash-3AN to dash-4AN coupler

Sensors

Throttle Angle

M 0280 001
Bosch, D Drive ClockWise

M 518-2846-100K
Rotary-blade drive, 100° rotation

M 518-1
D drive CounterClockWise

M 518-RP5130-35
Rotary-blade drive, 350 degrees. Used to create gear voltage on sequential gear boxes

M 518-3
D drive ClockWise

M 580-06751
Noncontact hall ClockWise

Lambda Sensors

All three of these sensors feature 18mm X 1.5mm Threads

M 0258 002
Bosch LSM-11 4 Wire Wide Band
For use with M4/M48 ECU's and MoTeC ADL. Can also be used for Narrow Band

M 0258 666
Bosch LSU-4 5 Wire Wide Band
For Use with M800/880 and PLM's Low cost High Accuracy

M UEGO SENSOR
NTK UEGO PRO 5 Wire Wide Band
For Use with M800/880 and PLM's - Laboratory Grade Sensor

M 0258 032
Bosch LSU-4.9 Sensor
For Use with M800/880 and PLM's - Laboratory Grade Sensor

What is Lambda anyway?

Lambda describes an equivalence value in percentage of the chemically correct air-to-fuel ratio for any type of fuel. If the air fuel ratio measured in the exhaust pipe of an engine is at the chemically correct (stoichiometric) ratio of air-to-fuel, lambda is equal to 1.0. In the case of gasoline, lambda 1.0 is equivalent to 14.7:1 air-to-fuel. Lambdas less than 1.0 indicate the engine is running richer than stoichiometric, while lambdas greater than 1.0 indicate a lean mixture. If we measure a lambda value of 1.06 and we want a lambda value of .95, we simply increase the fuel delivered to the engine (pulsewidth) by 11 percent. This will place us exactly at .95 lambda. By using the Lambda Was or the Quick Lambda functions a tuner can quickly shape the fuel table to match the engine's exact requirements.

How long will the Lambda Sensor Last?

A Lambda sensor is designed as a consumable item which means like a spark plug, it wears out with use. Typically you may notice the sensor begin to slow down in its response to changes in lambda when it becomes worn out. This normally occurs in about 500 hours on unleaded type fuels but is reduced to 50 hours for lead. Like Spark Plugs, the sensor can be fouled in a matter of minutes with improper air fuel ratios and the sensor can crack if it is over torqued or dropped. For this reason, there is no warranty on Lambda Sensors.

MoTeC ECU Sensors

Air Temp

M 25-7225
Air, NTC AC special

M 0280 039
Air, NTC 12mm

M 0280 060
Air, NTC 12mm long reach

Liquid Temp

M 0280 026
Coolant, M12x1.5

M 0280 026M
Coolant, 1/8 NPT

M 25-5227
Coolant, 3/8 NPT

M 25-2197 D
1/8 pipe stainess temp sensor with flying lead

Head Temp

M 0280 059
Cylinder-head, M12x1.00 LH

M 0280 070
Cylinder-head, M10x1.00 RH

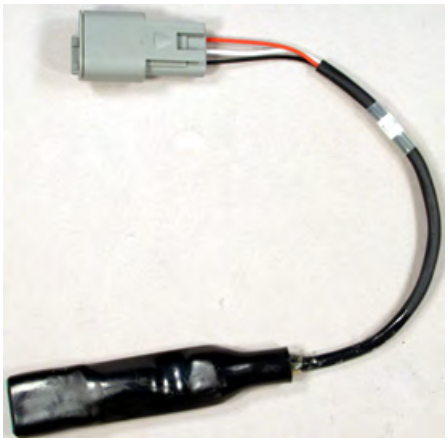
Tip:

Exhaust-temp measurement has never been easier or more affordable.
Thermocouple amplifiers can drive past either a temp input or an analog voltage input making them easy to configure into your system.

Open Ended or Closed Ended?

Open ended sensors react faster than closed ended sensors, however they do not last as long. What you gain in response time you give up in longevity.

Exhaust Temp



M TCA
Thermocouple amplifier

M TC2C
K-Type Thermocouple
1/8" Closed end with 12" lead
(requires thermocouple amp)

M TC SS20012WBT
1/8" K-Type Thermocouple stainless bung

M TC SS40064WBT
1/4" K-Type Thermocouple stainless bung

Plug-and-Play Basic or Custom-Made

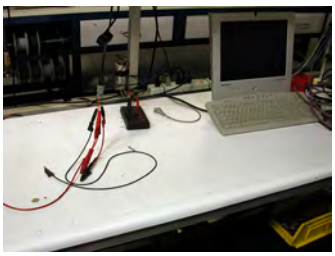
MoTeC ADL2 Hardware

Custom ADL2 Harnesses

Custom harnesses are built to your exact specifications and priced by project. Call for a quote.

Most-specified options for Custom ADL2 harnesses include:

- Autosport and Micro connections
- Raychem transitions/tubing
- Autosport junction boxes
- Custom length and breakouts



Call our wiring team for a harness built to your specs—and ask about our outstanding designs for a variety of special purposes.

If we dont have what you need, we will make it.

Telephone
(704) 799-3800
Fax
(704) 799-3874

ADL / ADL2 / SD Harnesses

MoTeC ADL Hardware

Basic Harness

Employs Tefzel conductors
Raychem DR-25 shrink

M ADL2 H30 I/O
Basic Expandable Dash Harness

M ADL H50 I/O
Add 20 I/O to basic harness

M H SDL3 BASE
Standard Sport Dash 3 Harness

M ADL3 H52 I/O
52 I/O Expandable ADL3 Harness

Battery Lead - 24”
Analog Volt Input 1-10 - 34”
Analog Temp 1-4 - 39”
Switch In - 40”
Speed In 1-4 - 40”

Beacon - 6”
Digital 2 - 30”
Lambda 1 - 18”
Lambda 2 - 18”
Aux Out 1-4 - 32”
RS-232 In - 24”

Harness Extensions

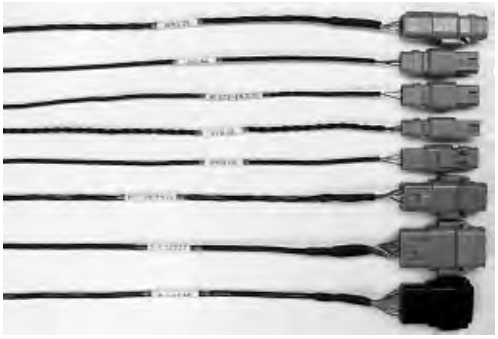
M ADL BRX-2-EXT
10’ beacon receiver extension

M ADL COM-EXT
10’ comm extension

M ADL WS-EXT
10’ wheel speed extension

M IGN EX H 10
10’ Ignition Expander extension

M TC MUX H 10
10’ Traction Control Multiplexer extension



Dash Harness Extensions

- Extensions connect the basic harness to the individual sensor
- Available in 5’ and 10’ lengths
- Sensor end of extension is terminated to suit the sensor
- ADL end is terminated with female MilSpec sockets

ADL Extension Types:

Beacon
Dual beacon
Pressure sensor
2-wire DTM
2-wire DTM
4-wire DTM
6-wire DTM
8-wire DTM
Lambda sensor
Air-temp Bosch
Air-temp GM
Engine-temp GM
Accel 1-axis
Accel 3-axis
Steering angle
Autosport micro

MoTeC Wiring

ECU Harnesses

Our craftsmen combine their design expertise with your concepts for outstanding results.

MilSpec connector

labels identify each cable end

Raychem DR-25 shrink and boots

Unterminated, Trim-to-Length Harnesses

Features:
- Tefzel conductors
- sold in 10′ unterminated length
- bundled and routed by customer

Available covering:
- High Heat Fiberglass tubing

M800 H10
M400/600/800 harness, 10′

M4 H 10
M4 basic harness, 10′ (shown)

M48 H 10
M48 basic harness, 10′

Termination kits (not shown)

M4 TERM
M4 termination kit

M48 TERM
M48 termination kit

M800 TERM
M800 termination kit

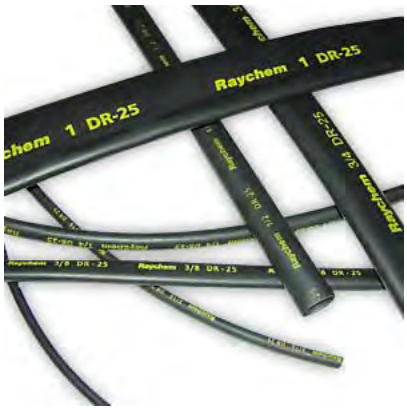
Full-Custom Harness

• Lightweight
• Raychem materials
• Tefzel conductors
• MilSpec or Autosport terminated
• Custom made for you by MoTeC in house
• Factory tested for plug-and-play operation

Typical 4 cylinder M4 Harnesses run $1,250 up
Typical 6 cylinder M48 Harnesses run $1,500 up
Typical 8 Cylinder M48 Harnesses run $1,750 up
Typical M400 -800/880 Harnesses run $2,200 up

Steps to build your Custom Harness

1. Choose what components you want included in the wiring harness.
2. Decide where on the car/bike/boat you want each of these components
3. Draw a diagram of the layout of the project
4. Call MoTeC and discuss your ideas with the wiring team
5. Measure distances in inches from the ECU Header to the components.
6. Provide MoTeC with the length requirements for the harness.
7. Receive your custom harness from MoTeC in 2 -3 Weeks



Heat Resistant Sheathing

• Lightweight
• Alternative to Raychem
•Several Sizes
•$Call for Pricing

Update Units

M4 SUU
M4 / M48 / MIL-Spec M8 Software update unit (SUU) required for firmware updates

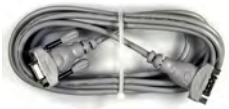
Note: M4 ECU's with serial number greater than 3000 do not require SUU to upgrade!

Comm Cables ECU-PC

Communications Cable for M48 / M8. Available in 6 or 20 foot lengths

M RS-232 MK 3
6 foot harness

M RS-232 MK3 6M
20 foot harness



M RS-232 M4E
10' RS-232 Serial Cable, M4e and M800/880 with DOS Software

M RS-232 MK3 M
Communications Cable for M48 / M8 with ADL link. Allows ECU data to be sent to ADL

What is an M4e?

M4e refers to a new generation of M4. The difference between M4e and the older M4 version is the communications spec. The M4e has RS-232 communications which do not require a special cable. M4 ECU's with serial numbers greater than 3000 are the new M4e and do not require the special cable. Additionally no Software Upgrade Unit is required to upgrade the software version on the M4e.

M4e Comms Pinout

9 Pin DSub

Pin 2 = TX - Connects to ECU Pin 22 Green Wire
Pin 3 = RX - Connects to ECU Pin 23 Orange Wire
Pin 5 = 0v - Connects to ECU Pin 21 Brown Wire

Comm Cables ECU-PC, cont.

M CIM
CIM module (computer-interface module)
Converts TTL to RS-232

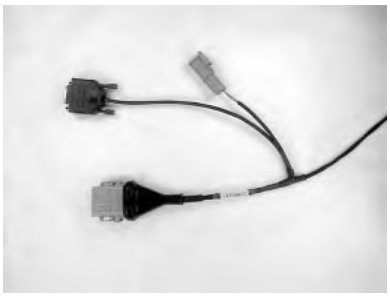
PC parallel-to-CAN cable. Required for PC comm using M800/880 ECU Manager software. Also used for firmware upgrades and logged data retrieval on the M800 family of ECUs running DOS EMP

M ADL CAN

M ADL CAN 25'
CAN Extension Cable 25 Foot

M ADL CAN 36'
CAN Extension Cable 36 foot

M ADL CAR
Car-side CAN cable (not shown)



M4 CIM H

M48 CIM H

CIM cable, connects ECU, ADL, and PC to CIM. More rugged design for permanent installation in vehicles.

MoTeC USB To CAN Adapter

The MoTeC USB to CAN adapter is used to replace the CAN interface cable (P/N M ADL CAN) in instances where a computer needs to use USB rather than a parallel port for communications. Requires ECU manager version 2.3 or Dash manager 3.2 or above.

Includes a 6 ft. cable USB A plug to B plug.

M UTC
MoTeC USB To CAN Adapter

MoTeC STC (Serial to CAN) Adapter

The STC (Serial to CAN) adaptor converts RS232 data to CAN and vice versa allowing multiple RS232 devices to be connected to a Data Logger via CAN.

Features

- Resin filled machined anodised aluminium case with through hole fastening
- Flying lead
- Bi-directional
- Converts RS232 to CAN to display andlog GPS data —position, true ground speed and GPS beacons— and ECU data
- Converts CAN to RS232 for transmitting telemetry
- Compatible with TTL voltage levels to connect early M4s and all M48s to a Dash Logger

The 2 baud rates currently available are:
19200 used for the M GPS-G5
57600 used for the M GPS BL

M STC
** MoTeC Serial to CAN Adapter

**Baud rate must be specified at the time of purchase as the STC is non-configurable

MoTeC Lambda to CAN Adapter

M LTC
Lambda to CAN

M LTCD
Dual Lambda to CAN

MoTeC's LTC and LTCD (Lambda to CAN) modules monitor, control and diagnose Bosch LSU 4.9 Lambda sensors, transmitting readings on a CAN bus. When multiple LTCs are used, up to 32 Lambda sensors can be configured on a single CAN bus, allowing an ECU or logging device to simultaneously monitor numerous Lambda sensors.

Inputs/Outputs
1 x Bosch LSU 4.9 Lambda sensor
Power supply voltage 11 V – 16 V
Power supply current 110 mA typical plus the sensor heater current (heater current is typically 0.5 A – 1 A and up to 2 A on startup)

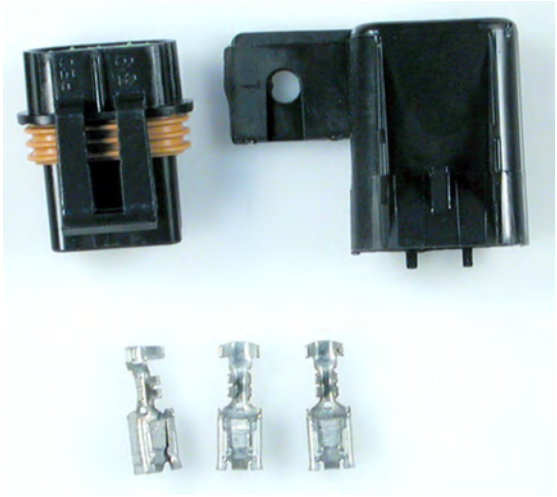
Communications
1 x CAN at 1 Mbit/sec

Connectors
1 x 4 pin male DTM connector (power/CAN)
2 x mating connector for Bosch LSU 4.9 sensor

Physical
Dimensions 38 x 26 x 23.5 mm excluding wiring looms and connectors
Weight 100 grams
Maximum ambient temperature 100 °C

Wiring and Related

M 14-2635K
MoTeC Relay Kits
Bosch Relays with Sealed housings and mounting tabs.
Includes Terminals



M 12-7868K
MoTeC Relay Fuse Holder Kit
Fuse Holder, Seals and terminals

Multi Relay Fuse Bar Holder
Anodized Aluminum for Multiple Relays/Fuses

M REL H1
1 Position Holder

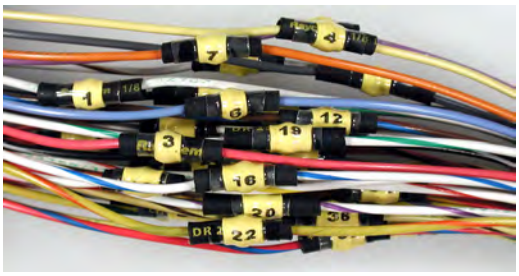
M REL H2
2 Position Holder

M REL H3
3 Position Holder

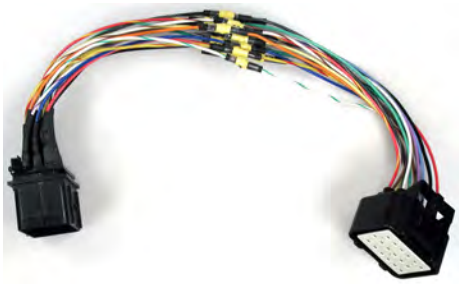
Diagnosis and Testing

MoTeC Break-Out Harnesses

The absolute best way to interogate your harness non-intrusively!
A Must for electrical Troubleshooting
Breakouts available for all popular connectors



M800 BOH



M ECONO 18 BOH

M ECONO 36 BOH

Also available

M880 BOH

M ADL BOH

MoTeC Comms Tester and Power Up Harnesses

Allows ECU to be powered and communicated with
Excellent for upgrading ECU only or diagnosing comm's problems with the harness

Comms Tester for M4/M4e/M48 ECU's

M 36 WAY COMM H

Also available

Tester for M400/600/800

M800 COMM

Crimping Tools

M 12-9500
Metripack - No Seal Crimper

GM 6285847
10 - 12 Ga Faston Crimper

M 3126 CT
Small Universal Crimper

OB-1028
14-24 Ga Open Barrel Crimper

Crimping Tools

M 12-4254
Weather Pack with Seal Crimper

M 12-5271
Universal Open Barrell Crimper

M 12-5270
Universal Crimper

OB-1026
16-30 Ga Open Barrel Crimper

Crimping Tools

M CW-935
W-crimper

BC-1265
Buttsplice crimp tool

M22520/1-01
Large MilSpec crimper

M22520/1-02
Crimp Head for Large MilSpec crimper

Required for Large DTM and Milspec Firewall Connectors

M22520/2-01
Small MilSpec crimper **(requires turret)**

Turrets for Small MilSpec crimper

M22520/2-07
Autosport 22GA sockets (ADL)

M22520/2-09
Autosport 22GA pins

M22520/2-10
Autosport 20GA sockets (CDI-8)

M 225034
Autosport micro sockets

M 225035
Autosport micro pins

M22520/2-02
Turret for DTM and Mil-Spec

Extractor Tools

1. MS M81969/14-01
ADL Autosport Micro Extractor

1

2. MS M81969/14-10
CDI-8 Autosports Extractor

2

3. MS M81969/14-11
Size 20

3

4. MS M81969/14-03
Size 16

4

5. MS M81969/14-04
Size 12

5

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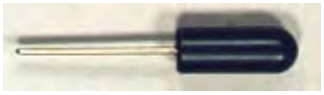
6. M 12-1876
Black LK Type Extractor

6 

7. EXWP
Yellow Weather Pack Extractor

7

8. M 12-4429
White Extractor Tool

8

9. M 12-4430
Blue Extractor Tool

9

MAP Sensor Connector Kits

M 120-5796K
GM Style 200/300 KPA MAP
Connector color Black

M 120-0403K
GM Style 100 KPA MAP
Connector Color Green

M 120-5800K
GM Style 108 KPA Baro
Connector color Blue

MAP Sensor Connector Colors

The standard colors which are used with GM type MAP sensor connectors tells you which type of sensor it is. For example:

Green connector 1 BAR MAP

Blue connector 108 KPA BARO

Black connector 2-3 BAR MAP

2 and 3 BAR MAP Sensors both have the same keying on the connector and can be easily interchanged as long as the calibration in the ECU is changed to match the sensor being used.

Weather-Pack

1. M 120-5791K
1-pin male housing kit

2. M 120-0996K
1-pin female housing kit

1

2

3. M 120-5792K
2-pin male housing kit

4. M 120-0973K
2-pin female housing kit

3

4

5. M 120-5793K
3-pin TPS male housing kit

6. M 120-0717K
3-pin female housing kit

5

6

A word about Weatherpack

The Delphi Weatherpack series of connectors can be used with wire sizes ranging from 12 Ga to 20 Ga. There are corresponding seal sizes and terminal sizes to match the wire size. Before placing your order make sure which sizes you will require so that we can incorporate the proper sized terminals and seals into your order for you.

Weather-Pack, cont.

1. M 120-5797K
4-pin male housing kit

2. M 120-0974K
4-pin female housing kit

1

2

3. M 120-5799K
6-pin male housing kit

4. M 120-0975K
6-pin female housing kit

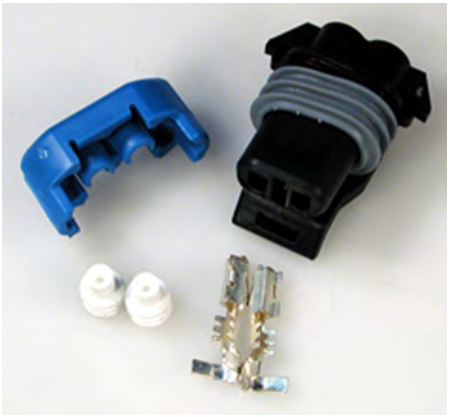
3

4

Metripack

5. M 12-2641K
Sealed 2-pin male Boost Valve Kit

6. M 12-2000K
Sealed 2-pin female housing kit



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7. M 12-7937K
Sealed 8-pin male housing kit

8. M 12-7931K
Sealed 8-pin female housing kit

7

8

Metripack, cont.

1. M 122-2193K
GM engine temp term kit

2. M 122-2197K
GM air temp term kit

1

2

3. M 15-7275K
3 pin PSI Transducer term kit

4. M 15-9568K
LS-2 & LS-7 coil term kit

3

4

Pull to Seat Style

The Delphi pull to seat style connectors such as those used for Engine Temp and Air Temp and IAC require that you cut the wires longer than needed. You then insert the wires through the connector and terminate with the wire sticking through the front of the connector. Then - as the name implies - you pull the wires back into the connector until the terminal seats itself.

Miscellaneous

5. M 90980-11162K
2 pin Toyota VVT term kit

6. M 90980-11885K
4 pin Toyota coil term kit

5

6

7. M 6189-0039K
2 pin injector connection kit
- Nissan, Toyota

8. M 14A464 K
Ford Cobra, LS-2/LS-7 injector
term kit

7

8

Miscellaneous, cont.

1. M 12-7023K
Toyota Ref/Sync term Kit

2. M 12-4669K
LSU 4.9 term kit

1

2

3. M 4CYLK
4 cylinder injector term kit

4. M 4CYLK 90
4 cylinder injector term kit
w/90 deg boots

3

4

5. M 6CYLK
6 cylinder injector term kit

6. M 6CYLK 90
6 cylinder injector term kit
w/90 deg boots

5

6

7. M 8CYLK
8 cylinder injector term kit

8. M 8CYLK 90
8 cylinder injector term kit
w/90 deg boots

7

8

DTM Kits

DTM connectors feature 20 AWG MilSpec contacts in plastic housings.

1. M DTM-2SK
2-pin female housing Kit

2. M DTM-2PK
2-pin male housing Kit

1

2

3. M DTM-3SK
3-pin female housing Kit

4. M DTM-3PK
3-pin male housing Kit

3

4

5. M DTM-4SK
4-pin female housing Kit

6. M DTM-4PK
4-pin male housing Kit

5

6

7. M DTM-6SK
6-pin female housing Kit

8. M DTM-6PK
6-pin male housing Kit

7

8

9. M DTM-8SK
8-pin female housing Kit

10. M DTM-8PK
8-pin male housing Kit

9

10

11. M DTM-12SK
12-pin female housing Kit

12. M DTM-12PK
12-pin male housing Kit

11

12

DT Kits

DT connectors feature 16 AWG MilSpec contacts in plastic housings.

1. M DT-2SK
2-pin female housing Kit

2. M DT-4SK
4-pin female housing Kit

3. M DT-6SK
6-pin female housing Kit

4. M DT-12SK
12-pin female housing Kit

5. M DT-2PK
2-pin male housing Kit

6. M DT-4PK
4-pin male housing Kit

7. M DT-6PK
6-pin male housing Kit

8. M DT-12PK
12-pin male housing

1

2

3

4

5

6

7

8

DTP Kits

DTP connectors feature 12 AWG MilSpec contacts in plastic housings.

2-pin male housing Kit
M DTP-2PK

2-pin female housing Kit
M DTP-2SK

4-pin male housing Kit
M DTP-4PK

4-pin female housing Kit
M DTP-4SK

Bosch Sensors

1. M LK-2 KIT
2-pin female Kit

2. M LK-3 KIT
3-pin female Kit

1

2

3. M LK-4 KIT
4-pin female Kit

4. M LK-5 KIT
5-pin female Kit

3

4

5. M LK-7 KIT
7-pin female Kit

6. M LSU TERM
Term Kit for LSU sensor

5

6

7. M LAMBDA KIT
Lambda sensor term kit

7

Boots

RB 4972
Straight boot for LK-2 connector

RB 290
90 degree boot for LK-2 connector

RB 3
Straight boot for LK-3, LK-4, and LK-5 connectors

RB 390
90 degree boot for LK-3, LK-4, and LK-5 connectors

RB 6
Straight boot for LK-6 connector

RB 7
Straight boot for LK-7 connector

Vinyl Boots

Fits mating connectors of MoTeC expansions boxes.

M DRC26-24BT

Fits mating connectors of most ecu's

M DRC40-BT
Straight Boot

M DRC40-BT-90
90 degree boot

M 1558
Bellow boot that fits the mating connections of the ADL2 and ADL3

Will also fit the mating connectors of the following with adaptor bushings

3606
M880 adaptor bushing

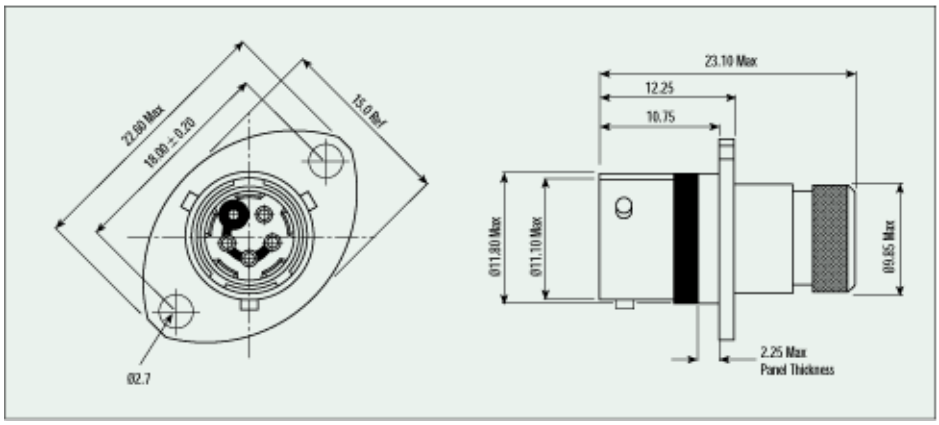
3607
Sport Dash adaptor bushing

3605
CDI-8 Adaptor bushing

Autosport Connectors

Micro Series

RECEPTACLE – TYPE 0 & 2



Specifications:

- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - - Contacts: Copper alloy
    Gold plated
  - - Insulators: Thermoplastic
  - - Interface/Wire seals: Fluorinated silicone

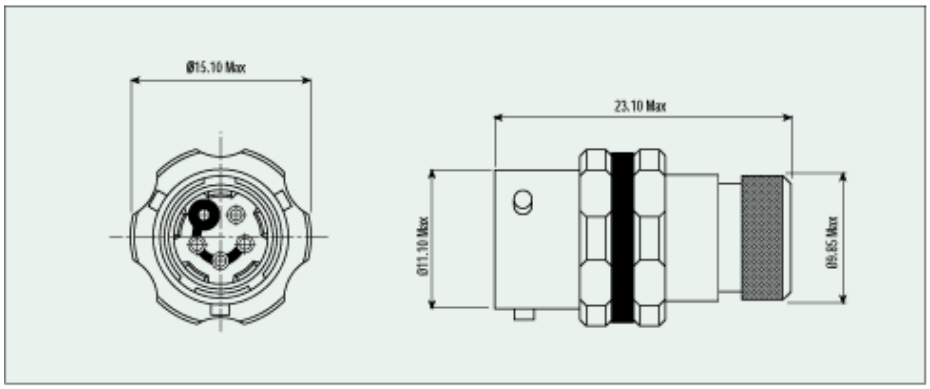
Features:

- Compact Design
- Cable accommodation - 22, 24, 26, & 28 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- 5 Keyway orientations
- Universal orientation for test equipment (Plug type 6 only)

Item Number	Contact Type	Key Color
MS ASL006-05PA	Pin	Yellow
MS ASL006-05PB	Pin	Blue
MS ASL006-05PC	Pin	Orange
MS ASL006-05PD	Pin	Green
MS ASL006-05PN	Pin	Red
MS ASL006-05SA	Socket	Yellow
MS ASL006-05SB	Socket	Blue
MS ASL006-05SC	Socket	Orange
MS ASL006-05SD	Socket	Green
MS ASL006-05SN	Socket	Red

Micro Series con'd

INLINE RECEPTACLE – TYPE 1



Specifications:

- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - - Contacts: Copper alloy
    Gold plated
  - - Insulators: Thermoplastic
  - - Interface/Wire seals: Fluorinated silicone

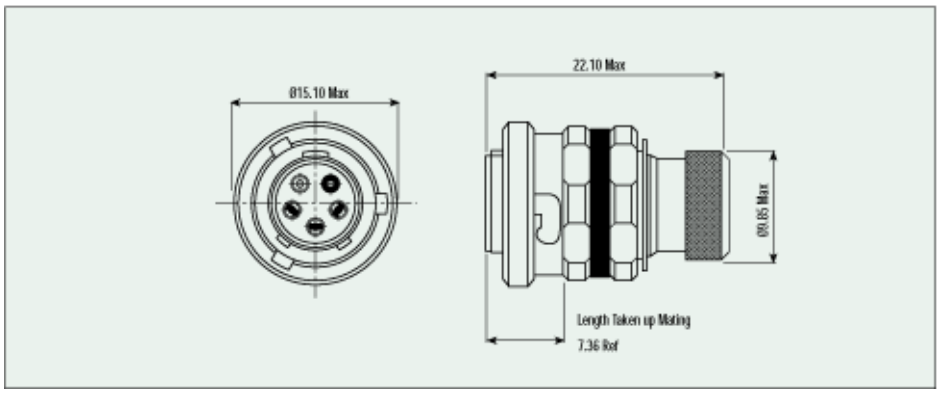
Features:

- Compact Design
- Cable accommodation - 22, 24, 26, & 28 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- 5 Keyway orientations
- Universal orientation for test equipment (Plug type 6 only)

Item Number	Contact Type	Key Color
MS ASL106-05PA	Pin	Yellow
MS ASL106-05PC	Pin	Orange
MS ASL106-05PD	Pin	Green
MS ASL106-05PN	Pin	Red
MS ASL106-05SA	Socket	Yellow
MS ASL106-05SB	Socket	Blue
MS ASL106-05SC	Socket	Orange
MS ASL106-05SD	Socket	Green
MS ASL106-05SN	Socket	Red

Micro Series con'd

PLUG – TYPE 6



Specifications:

- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - - Contacts: Copper alloy
    Gold plated
  - - Insulators: Thermoplastic
  - - Interface/Wire seals: Fluorinated silicone

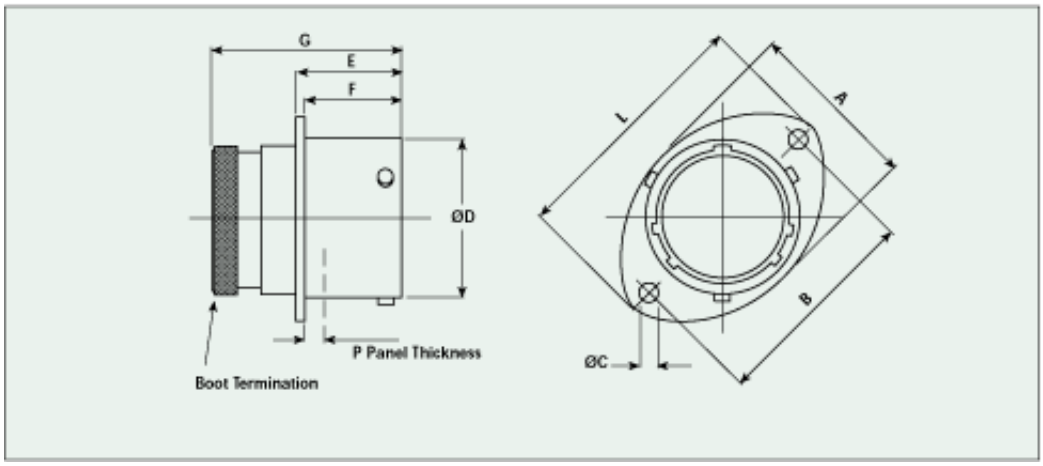
Features:

- Compact Design
- Cable accommodation - 22, 24, 26, & 28 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- 5 Keyway orientations
- Universal orientation for test equipment (Plug type 6 only)

Item Number	Contact Type	Key Color
MS ASL606-05PA	Pin	Yellow
MS ASL606-05PB	Pin	Blue
MS ASL606-05PC	Pin	Orange
MS ASL606-05PD	Pin	Green
MS ASL606-05PN	Pin	Grey
MS ASL606-05PU	Pin	Red
MS ASL606-05SA	Socket	Yellow
MS ASL606-05SB	Socket	Blue
MS ASL606-05SC	Socket	Orange
MS ASL606-05SD	Socket	Green
MS ASL606-05SN	Socket	Red
MS ASL606-05SU	Socket	Grey

AS Series

RECEPTACLE – TYPE 0



Specifications:

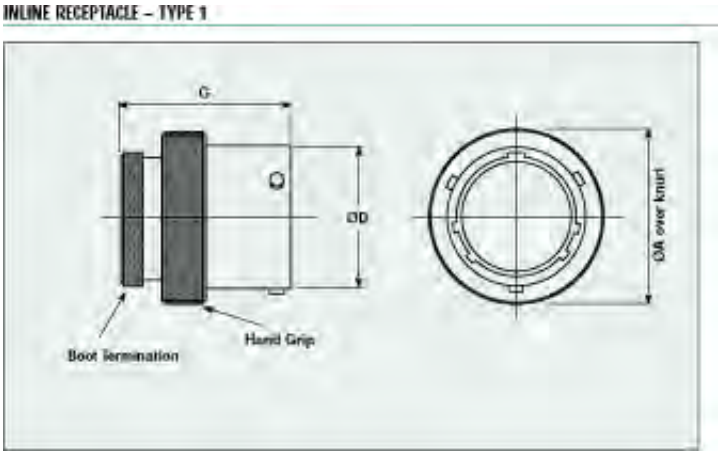
- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - - Contacts: Copper alloy
    Gold plated
  - - Insulators: Thermoplastic
  - - Interface/Wire seals: Fluorinated silicone

Features:

- High Density arrangements up to 128 ways
- Three contact sizes: 16, 20, and 22 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- Filter, Hermetic and Fiber Optic options available
- Universal orientation for test equipment

		Number of Contacts			
ItemNumber	Contact Type	Size 22	Size 20	Size 16	Key Color
MS AS008-35PN	Pin	6			Red
MS AS008-35SN	Socket	6			Red
MS AS010-35PN	Pin	13			Red
MS AS010-35SN	Socket	13			Red
MS AS010-98SN	Socket		6		Red
MS AS012-35PN	Pin	22			Red
MS AS012-35SN	Socket	22			Red
MS AS012-98SN	Socket		10		Red
MS AS014-19PN	Pin		19		Red
MS AS014-19SN	Socket		19		Red
MS AS014-35SN	Socket	37			Red
MS AS016-26PN	Pin		26		Red
MS AS016-26SN	Socket		26		Red
MS AS016-35PN	Pin	55			Red
MS AS016-35SN	Socket	55			Red
MS AS018-35PN	Pin	66			Red
MS AS022-21SN	Socket			21	Red

AS Series con'd



Specifications:

- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - Contacts: Copper alloy
    Gold plated
  - Insulators: Thermoplastic
  - Interface/Wire seals: Fluorinated silicone

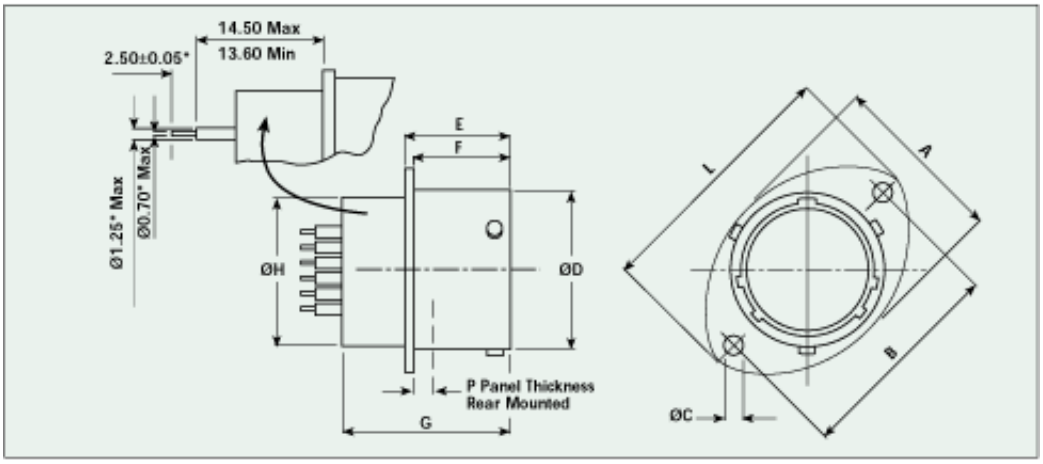
Features:

- High Density arrangements up to 128 ways
- Three contact sizes: 16, 20, and 22 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- Filter, Hermetic and Fiber Optic options available
- Universal orientation for test equipment

		Number of Contacts			
ItemNumber	Contact Type	Size 22	Size 20	Size 16	Key Color
MS AS108-35PN	Pin	6			Red
MS AS108-35SN	Socket	6			Red
MS AS110-35PA	Pin	13			Yellow
MS AS110-35PN	Pin	13			Red
MS AS110-35SN	Socket	13			Red
MS AS110-98PN	Pin		6		Red
MS AS112-35PN	Pin	22			Red
MS AS112-35SN	Socket	22			Red
MS AS112-98SN	Socket		10		Red
MS AS114-35PN	Pin	37			Red
MS AS114-35SN	Socket	37			Red
MS AS116-26PN	Pin		26		Red
MS AS118-35PN	Pin	66			Red

AS Series con'd

PCB BOX MOUNTING RECEPTACLE – TYPE 2



*Dimensions for 20 and 22 contacts shown are for standard parts. Other PCB contacts are available.

Specifications:

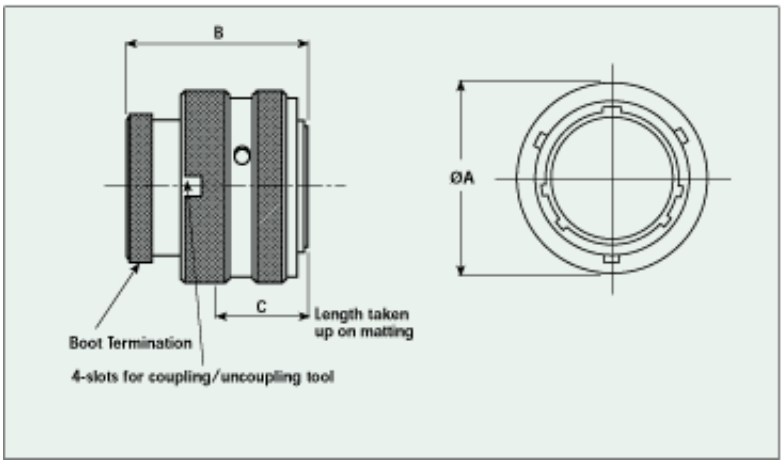
- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - - Contacts: Copper alloy
    Gold plated
  - - Insulators: Thermoplastic
  - - Interface/Wire seals: Fluorinated silicone

Features:

- High Density arrangements up to 128 ways
- Three contact sizes: 16, 20, and 22 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- Filter, Hermetic and Fiber Optic options available
- Universal orientation for test equipment

		Number of Contacts			
ItemNumber	Contact Type	Size 22	Size 20	Size 16	Key Color
MS AS208-35PN	Pin	6			Red
MS AS208-35SN	Socket	6			Red
MS AS210-35PA	Pin	13			Yellow
MS AS210-35PN	Pin	13			Red
MS AS210-35SN	Socket	13			Red
MS AS212-35PN	Pin	22			Red
MS AS212-35SN	Socket	22			Red

PLUG – TYPE 6



Specifications:

- Standard Connector
- Connector comes with pins/sockets and an insertion/extraction tool
- Materials
  - -Shell/Coupling ring: High Strength Aluminium alloy
    Black Zinc finish
  - Contacts: Copper alloy
    Gold plated
  - Insulators: Thermoplastic
  - Interface/Wire seals: Fluorinated silicone

Features:

- High Density arrangements up to 128 ways
- Three contact sizes: 16, 20, and 22 AWG
- Locking coupling mechanism
- Black zinc Finish
- Interfacial and wire sealing
- Integral screen/boot termination feature
- In-line and two hole mounting styles
- Gold-plated crimp contacts
- Filter, Hermetic and Fiber Optic options available
- Universal orientation for test equipment

		Number of Contacts			
ItemNumber	Contact Type	Size 22	Size 20	Size 16	Key Color
MS AS608-35PN	Pin	6			Red
MS AS608-35SN	Socket	6			Red
MS AS610-35PN	Pin	13			Red
MS AS610-35SA	Socket	13			Yellow
MS AS610-35SN	Socket	13			Red
MS AS610-98PN	Pin		6		Red
MS AS610-98SN	Socket		6		Red
MS AS612-35PN	Pin	22			Red
MS AS612-35SN	Socket	22			Red
MS AS612-98PN	Pin		10		Red
MS AS614-19PN	Pin		19		Red
MS AS614-19SN	Socket		19		Red
MS AS614-35PN	Pin	37			Red
MS AS614-35SN	Socket	37			Red
MS AS616-26PN	Pin		26		Red
MS AS616-26SN	Socket		26		Red
MS AS616-35PN	Pin	55			Red
MS AS616-35SA	Socket	55			Yellow
MS AS616-35SN	Socket	55			Red
MS AS618-35PN	Pin	66			Red
MS AS618-35SN	Socket	66			Red
MS AS620-16PN	Pin			16	Red
MS AS620-35SN	Socket	79			Red
MS AS622-21PN	Pin			21	Red

Apparrel

MOTEC HAT BLACK
MoTeC Flex-Fit Hat
Black with Red MoTeC Logo on front - website on back

MOTEC T-SHIRT
MoTeC T-Shirt
Black "Australian for Horsepower"
M,L,XL,XXL sizes

MoTeC Support

MoTeC personnel are ready to travel to your location anywhere in the world to offer technical assistance—or we'll help you by phone, fax, and email. Ask us about our annual training seminars.

On-site support

$Call for current pricing. Fees are charged per day (minimum of one day) payable to technition upon arrival at the site
$Call for current pricing. Fees are charged per day / travel (minimum of 2 days) payable in advance. Call for a quote on transportation, meals, and lodging.

Phone support

$Call for current pricing. Fees are charged per hour (billed in 60-minute increments)

Track-support packages

(per yearly subscription)
Call for Pricing

Online Help Files

MoTeC USA has begun placing HTML based help on our website for our customers. Visit www.motec.com and click the link to support to gain access to our helpfiles

MoTeC Glossary

Description of terms specific to EFI Industry

Sequential Fuel Injection

Sequential means that each injector for each cylinder is triggered only one time during the engine's cycle. Typically the injector is triggered only during the intake stroke. True sequential injection requires the ECU to know not only where top dead center is, but also which half of the cycle the engine is on. TDC on a 4 stroke occurs 2 times during the cycle, once on compression and once on exhaust. MoTeC references all timing events that occur within the ECU, to Top Dead Center Compression. This generally requires an input on the engine's camshaft to provide the ECU with a SYNC signal. Once the ECU is synched, injection timing can be optimized to provide the most efficient mixing of fuel and air into the cylinder. Control of injection timing can lead to increases in midrange torque while decreasing emissions and fuel consumption.

Semi-Sequential Fuel Injection

Semi-Sequential means that 2 or more cylinder's injectors are triggered at the same time, but only 1 time during the engine's cycle. This requires the ECU to be synched with the engine's cycle. Typically injection timing is retarded from the optimum timing point for full sequential by an angle which is equal to 1/2 the angle between 2 cylinders in crankshaft degrees. On a V8 Chevrolet, the injectors for cylinders 1 and 8 would be triggered at the same time. They would be triggered 45 degrees late for cylinder number 1 and 45 degrees early for cylinder number 8. Degrees between 1 and 8 = 90 ; 1/2 of 90 = 45. Semi-sequential allows optimization of injection timing which typically leads to increases in midrange torque and a reduction in fuel consumption for equivalent power compared which Batch fire.

Injection Timing

With a synced engine which uses 1 injector in each intake manifold runner, it is possible to phase the firing of the injector so that it only sprays during the intake stroke. This allows you to introduce fuel into the intake stream precisely at the time when the airflow into the cylinder is the greatest providing the best possible atomization and the highest efficiency. MoTeC offers a user definable 2 or 3 dimensional Injection Timing adjustment table so that you can accurately match any engine's injection timing demands. Tuners can select either beginning or end of injection on which to base the timing table. This allows the tuner the ultimate in adjustability to suit any engine combination. With the M4 and M48 ECU's Injection timing is adjustable in 5 degree increments while the M400/600/800 Series offer .1 degree resolution making them suitable for Gasoline or Diesel Direct Injection.

Batch Fire

Batch fire means that 2 or more injectors are triggered at the same time once every crankshaft revolution. If the ECU is synched with the engine's cycle, the injection timing can only be half optimized as fuel is injected both on the intake stroke and on the power stroke. Companion cylinders are paired in batch fire mode similar to wasted spark ignition modes. The advantage of batch firing is that the ECU needs only to know where TDC is. This means that a sync on the cam is not required. The disadvantage to batch firing is that the Injector Dead Time is doubled for the engine's cycle. This leads to a decrease in fuel flow and typically requires a larger, less efficient injector to be used to make up for the loss of flow. On High Horsepower applications this means the idle quality will suffer tremendously.

Injector Dead Time

Injector dead time refers to the latency of the injector in producing maximum flow rate. All injectors require a certain amount of time to open completely and produce maximum flow. The amount of time is dependant on several variables including; fuel pressure, battery voltage and physical characteristics of the injectors themselves. Typically higher fuel pressure or lower battery voltage tends to increase the dead time. This leads to a reduction in fuel flow in to the engine and as a result influences the engine's state of tune. Luckily MoTeC allows the user to define an injector Dead Time table if the values are known, or use a standard compensation which is known for a number of injectors. The ECU automatically adjusts the values as the battery voltage changes to ensure that the fuel curve remains constant. If a fuel pressure input is used on the system, MoTeC can compensate for variations in fuel pressure to achieve a consistent fueling even with varying fuel pressures.

Bank to Bank

Multipoint - Bank to Bank - Multipoint is the least efficient electronic method of injecting fuel into an engine. Each injector is physically located in a position which allows its fuel output to be delivered to a single cylinder, but the fuel is injected once per rev and injection timing is of no real value even if the ECU is synched to the engine's cycle because an entire bank of cylinder's injectors are fired at the same time. The advantage of Bank to Bank is that the ECU typically does not need to be synched at all. This makes it a simple retrofit to engines which never used crank or cam triggers, because it can run the engine with simply 1 pulse per cylinder firing. Ignition timing can still be adjusted, but it is required that the engine use a mechanical distributor to distribute spark from 1 coil. No individual cylinder trimming is possible.

Individual Cylinder Trim

When an ECU is synched to the engine's cycle, it becomes possible to individually adjust a cylinder's ignition advance and also if the engine is full sequential, the amount of fuel which is supplied to that cylinder. MoTeC allows individual overall trims of each cylinder's ignition and fuel quantity in all models. In the M4 and the M400/600/800, Individual cylinder trim tables are provided which allow the tuner to vary the timing and the fueling based on RPM and Load. Typically fully variable ignition advance requires the use of multiple coils to avoid rotor-tip to cap-terminal alignment problems which may lead to spark scatter. Additionally if a single inductive type coil is used, it is possible if high fluctuations in advance occur between cylinders, that the coil does not have sufficient time to charge which leads to reduced coil output energy and possible misfire.

Bank to Bank

Singlepoint - Singlepoint involves placing the injectors in a single common injection point in the inlet path. This is typically done on roots or screw supercharged engines and some normally aspirated engines. This provides the least efficient method of using Electronic Fuel Injection. About the only method which provides less control is Carburetion. From a power standpoint, single point is not tremendously worse. Fuel consumption is typically significantly increased over any of the above methods. There is virtually no control possible as far as each cylinder is concerned and the inherent problems of delivering 2 substances with differing mass through the same passages an into the combustion chamber are present. The advantage of Singlepoint is that it does not require the ecu to be synched in any way. MoTeC makes an attempt to smooth out the fuel delivery of singlepoint by triggering the injector drives in a staggered manner. This provides a smoother more consistent delivery of fuel and reduces the instantaneous drain on the battery/charging system which can lead to ignition misfire in other systems.

Narrow Band Lambda

Narrow Band Lambda provides an output voltage between .1v and 1.0v dc based on the oxygen differential between the exhaust pipe and the atmosphere. This can give an indication of the air fuel ratio at which the engine is running however the sensor range is limited to ratios of about 14.0:1 (1.0v) and 15.4:1(.1v). At ratios beyond this range, the sensor output does not increase or decrease making it virtually useless for tuning an engine for anything other than steady state cruising. The advantage of Narrow Band Lambda comes into play while trying to keep emissions in check. The sensor provides a signal to the ECU which basically indicates either rich (output voltage above .5v air fuel less than 14.7) or lean (output voltage below .5v air fuel greater than 14.7) but really does not describe to what degree the mixture is either rich or lean. This is fits perfectly in with the need for "perturbation" of today's 3 way catalysts which need excess air to catalyze Hydrocarbon and Carbon Monoxide, and excess fuel with which to reduce Oxides of Nitrogen. Because of this requirement by the catalyst, Narrow Band Lambda Control is constantly varying the air/fuel ratio both slightly above and below 14.7:1 in such a manner that the average air fuel ratio is maintained at 14.7:1. Most engines in use today, produce peak power with air fuel ratios in the 12:1 - 13.5:1 range well below the measuring capability of a narrow band lambda sensor. It is for this reason that Narrow Band Lambda is of no help for high loads and or RPM's.

Wide Band Lambda

Wide Band Lambda provides the ECU with a specific definition of the air fuel ratio at which the engine is currently running. Wide Band Sensors are able to depict air fuel ratio's as rich as 10.5:1 and as lean as 18:1 and report the exact lambda to the ECU. This is done a number of ways. MoTeC M4 and M48 ECU's use Bosch 4 wire Wide Band Lambda sensors to measure wide band lambda. MoTeC M400/600/800/880 ECU's use either the Bosch LSU or the NTK UEGO 5 Wire Wide Band Lambda Sensor. MoTeC then uses this information to determine the actual lambda and displays this on the console and or uses it for Lambda Control if the ECU is set up to do so.

4 Wire Wide Band Lambda Sensor

This technology takes advantage of the fact that a 4 Wire Wide Band Lambda sensor's voltage output is based on not only the oxygen differential between the exhaust pipe and atmosphere, but also is dependant on the temperature of the sensor itself. Sensor impedance varies with temperature, so a MoTeC ECU measures not only Wide Band Lambda Voltage, but also the sensor impedance. It is not possible to properly display lambdas without monitoring the sensor temperature. Systems which do not use at least a 4 wire sensor typically have errors in displayed lambda as high as 8%!

5 Wire Wide Band Lambda Sensor

This newer technology is used to determine the air fuel ratio of an engine by measuring lambda sensor output and measuring the current required to hold the sensor voltage output constant. An oxygen sensor produces voltage and a small amount of current as oxygen atoms pass across its substrate from high concentration to low concentration. The greater the flow of oxygen, the greater the voltage produced. This is the case when a rich mixture is encountered. Conversely, when current is applied to an oxygen sensor, oxygen atoms are moved from a low concentration to a high concentration or vice versa depending on the polarity of the current applied. The MoTeC M400/600/800/880 ECU's are capable of measuring this type of sensor input which offers increased speed and accuracy over the older technology 4 wire sensors. M4 and M48 ECU's can leverage the 5 wire technology by connecting a MoTeC PLM, which has a definable analog voltage output, to the Lambda input on the ECU.

Bosch LSU and NTK UEGO Sensors

Both the MoTeC M400/600/800/880 and the MoTeC PLM are capable of operating with either the NTK UEGO or the Bosch LSU-4 5 wire wide band sensors. Of the two, the NTK is most accurate. It is a true laboratory grade sensor. Its accuracy has been found to be about 1.5% better than that of the Bosch LSU. Additionally the NTK has a better response time than does the LSU again about 1.5%. The NTK is the benchmark against which the LSU is measured. The advantage of the LSU sensor is its lower price compared to the NTK. If you are doing very precise and accurate laboratory type testing, the NTK is the sensor for you. Both sensors have a life expectancy of 500 hours on unleaded fuels and that number is diminished to 50 hours using leaded fuels. Lambda Sensors are very similar to spark plugs with respect to their estimated life expectancy. Spark Plugs are designed to last 40,000 miles under optimum circumstances but they can be damaged in less than 1 mile by misuse. A lambda sensor can be thought of the same way. Misuse by overly rich mixtures, high temperatures, overtightening or dropping can have a very negative effect on lambda sensor life. Like spark plugs, lambda sensors cannot be returned under warranty.

What is Lambda?

Lambda describes an equivalence value in percentage of the chemically correct air-to-fuel ratio for any type of fuel. If the air fuel ratio measured in the exhaust pipe of an engine is at the chemically correct (stoichiometric) ratio of air-to-fuel, lambda is equal to 1.0. In the case of gasoline, lambda 1.0 is equivalent to 14.7:1 air-to-fuel. Lambdas less than 1.0 indicate the engine is running richer than stoichiometric, while lambdas greater than 1.0 indicate a lean mixture. If we measure a lambda value of 1.06 and we want a lambda value of .95, we simply increase the fuel delivered to the engine (pulsewidth) by 11 percent. This will place us exactly at .95 lambda. By using the Lambda Was or the Quick Lambda functions a tuner can quickly shape the fuel table to match the engine's exact requirements. In addition, the W Lambda function copies the Quick Lambda value to the sites immediately to the right and up above to help keep the fuel table variance from one site to another at a minimum.

Quick Lambda and Lambda Was

A MoTeC ECU, allows the user to define a lambda goal table based on load and rpm. The Quick Lambda function in the software allows a tuner to quickly adjust the values in the fuel control table to achieve the goal lambda, based on the lambda reported by the sensor. If the reported lambda is .98 and the goal is .93, the ECU automatically jumps to the current load site, and multiplies the value in the site by 1.05. The next time the engine runs in that site, the lambda will be .93. Similarly, Lambda Was allows a user to locate a load and rpm site in the main fuel table and enter a recorded lambda measurement from a data log. The ECU multiplies the load site value by the difference between entered lambda and the goal lambda value so that the engine will achieve the goal lambda the next time it runs on that load site. This makes tuning much faster and easier than calculating the required enrichment based on an air fuel ratio number. Of course you can manually do multiplication, division, addition and or subtraction on any site or a number of sites with only a few keystrokes, and the overall trim function allows you to trim the entire fuel or ignition table up or down based on percentage.

Lambda Control

There are two types of control methods used in closed loop fueling. Narrow band closed loop control attempts to keep the air fuel ratio "pertubating" (dithering) slightly richer and slightly leaner than stoichiometric for emissions control. In a MoTeC ECU, narrow band control is simply turned on or off based on load and rpm. Wide Band closed loop control measures the current lambda and adjusts the fuel delivered to the engine, by comparing the measured lambda to the preset lambda goal table.

Configurability

MoTeC ECU's are well known for their ability to be customized to meet the demands of nearly any application. Software configurable hardware within the ECU allows a tuner to match the requirements of any inductive or capacitive discharge type ignition available. Triggering can be done using hall effect, magnetic pickup, logic level switch or optical sensor. There are specific modes which are selectable to allow MoTeC to read LS-1, LT-1 Opti-Spark, Ford TFI, Subaru, Honda, Mazda, BMW, Nissan, Toyota, as well as aftermarket flying magnet or hall type crank triggers. If you make a change to a new type of trigger wheel, MoTeC allows you to simply redefine the signals in software. No need to send your ECU in for hardware upgrade. Every MoTeC ECU can be configured quickly so it is possible to borrow an ECU, send your calibration file to the new ECU and be up and running in merely seconds.

Data Logging

MoTeC M4 and M48 ECU's feature 512Kbyte non-volatile logging memory space. M800's feature a full Megabyte of logging space and the M880 is available with up to 4 Megabytes of logging memory. Tuners can select which items they want to log, and what rate they wish to sample. M4 and M48 can sample up to 20 times per second (.050 Seconds) while M800/880 max out at 200 times per second (.005 Seconds) Maximum logging time is dependant on the number of items being logged and the rate at which you are logging.M4 and M48 maximum logging time is 382 minutes at 1 sample per second. If the logging memory becomes full, MoTeC automatically begins logging over the top of the existing log ensuring that you will always have the most recent data available in your log when it is retrieved.

RPM Limiting

RPM Limiting can be done a number of ways using MoTeC. Software allows you to select whether your cut will be based on fuel only, ignition only, fuel with ignition 100 rpm above, ignition with fuel 100 rpm above or both fuel and ignition at the same time. An adjustable control range allows the tuner to set the harshness of the cut and an adjustable randomizer gives the tuner the opportunity to get a fully random cut no matter what number of cylinders the engine has. The overall RPM Limit sets the maximum engine rpm you want the engine to ever see. Other cuts allow starting line rev limits which typically are lower than the maximum rpm limit. Using a 9 position trim switch, MoTeC can provide you with 9 separate, driver selectable RPM Limits for ultimate adjustability to conditions without the need for a laptop to change the setting.

Oddfire tables

Tables in the ECU describe the oddfire angle in crank degrees for use on oddfire engines such as the Viper V-10, Harley Davidson V-Twin and the Chevy V-6. Simply tell the ECU the number of degrees past TDC Number 1 that each cylinder arrives at its own TDC. A special requirement for triggering is needed to run the oddfire engines. The crank input must have at least 1 tooth per TDC and they must be evenly spaced. This usually requires a 12 tooth wheel in the case of the V-6 Chevy. MoTeC CDI-8 Capacitive discharge Ignition can be used to supply the spark to oddfire engines of 8 cylinders or less controlled directly by a MoTeC ECU. For engines with greater than 8 cylinders, 2 CDI-8's can be used.

Comprehensive Online Help

All MoTeC software comes with Comprehensive online help available by pressing the F1 key on your keyboard. Whether it is Engine Management, Data Acquisition or our Data analysis software you can always access the help files through the use of the F1 key.

CDI-8 Ignition

Capacitive Discharge Ignition has been used in racing and in some automobiles for a number of years. MoTeC offers one of the industry's most advanced capacitive discharge ignition systems available. The CDI-8 is an 8 channel CD Ignition which can either run in stand alone mode (meaning it does not require an ECU to run it) or in slave mode. In slave mode, the CDI-8 receives an encoded signal from a MoTeC ECU which tells it which coil output to fire. In this mode, a CDI-8 can deliver a full energy spark at up to 1.1KHz which is enough to keep up with an 8 cylinder engine turning 16,000 rpm!

MoTeC Software

Always free from www.motec.com New software upgrades will allow additional features for your ECU. Since each ECU is produced with all of the same hardware, there will never be an issue of a feature not working with an older ECU. New features will always work with every ECU.

Security

MoTeC offers its customers the option of securing their tuning file through two methods. The first is a simple password protection which can be set on the ECU so that others are not able to make changes to the tuning file nor can they send a new file to the ECU unless they have the password. The password can be reset as often as you like, and you may choose to turn the password off at anytime but you must know the password in order to perform these functions. Additionally, MoTeC allows the tuner to encrypt a file which is stored within the ECU. In this case, the file can only be sent to an ECU which has a matching password for the encrytped file. If file encryption is used, a tuner could send an encrypted file to a customer with a matching password, and the customer would be able to send the file to the ECU without knowing the password. The customer would still not be able to view or in anyway modify the file. Data downloads can always be retrieved whether or not a password is set on an ECU.

High/Low Injection Capability

On many types of racing engines, tuners may find improved efficiency by changing the physical location of the injector in relation to the intake valve. MoTeC allows the user to run 2 sets of injectors in the inlet path and switch from one to the other with a 3 dimensional table based on load and rpm. Typically this feature is used when an engine is making substantial amounts of horsepower but requires only small amounts of fuel at low speeds. In this case, the tuner can select 2 injectors of differing flow rates, one for low speed operation, the other for high speed/power operation. MoTeC allows you to define the flow differential between the 2 injectors, so that the proper amount of fuel can be delivered out of each injector. Another way to use the MoTeC High/Low capability, is to use 2 injectors of equal flow rate, but located at different points in the inlet path. In this manner, fuel injection location can be varied at certain points in the rpm band to provide the highest efficiency. Of course MoTeC allows you to enrich or enlean the engine at the transition from 1 set of injectors to the other to provide seamless operation.

Crank Index Position

The CRank index Position is perhaps the most important timing value in the ECU. The CRiP tells the ECU where the engine is in relation to TDC Cylinder #1. The CRiP is defined as the distance in crankshaft degrees, between the reference tooth when it is aligned with the crankshaft position sensor, and Top Dead Center Compression Number 1. For example, if the reference tooth is aligned with the crankshaft sensor when the crankshaft is 55 degrees before TDC Compression Number 1, then the CRiP is 55. An easy way to determine the CRiP before startup is to rotate the crankshaft in the direction of rotation until the reference tooth is aligned with the crankshaft position sensor. Then measure the number of degrees, required to turn the crankshaft in the direction of rotation until the number 1 cylinder is at Top Dead Center of the Compression stroke. Once you determine this value, you may start the engine and enter the CRiP set screen under the Ignition menu. Use a non dial-back timing light to check the CRiP. The timing advance displayed in the CRiP set screen should match the measured value using the timing light. If they do not match, move the CRiP value until the timing does match.

Reference Tooth

The definition of the Reference Tooth depends on the type of Ref/Sync mode being used. If using missing or extra tooth type modes, the reference tooth is defined as the tooth which occurs directly following the missing or extra tooth or teeth. If using 1 tooth per TDC or Multiple tooth mode with a sync input, the reference tooth is defined as the tooth which occurs directly following the sync input.

Rotary Ignition Split

Factory Rotary engines use 2 spark plugs per rotor. Both spark plugs in a common rotor are not fired at the same time. There is a delay between the time when the leading spark plug is fired, and when the trailing spark plug is fired. MoTeC wrote special software to be able to mimic this type of ignition control for rotaries in the M4 and M800/880. A table is available to define differing amounts of timing split to suit any application and driving condition. Of course if you do not wish to use the split timing function MoTeC can accomodate that as well.

Auxiliary Tables

MoTeC Engine Management systems are extremely adaptable to differing engine requirements. One way MoTeC makes this possible is through the use of Tuner definable output controls. A 3 dimensional table can be selected by the tuner with several inputs available to use as the table axes. Typically Engine RPM, Engine Temperature, Air Temperature, Manifold Pressure, Throttle Position and Auxiliary Inputs are available to set up the table. Tuners typically use this type of control for engines which have switchable cam profiles such as the Honda V-Tec. The 3D table can be set so to Throttle Position versus RPM for example and the tuner can turn on the V-Tec based not only on RPM but also load so the cam timing can be optimized for varying loads.

Fully Variable Camshaft Timing

MoTeC is proud to be the industry leader in the aftermarket for controlling engines with fully variable camshafts. We have several special modes written to allow full control of up to 4 fully variable camshafts per engine such as the Dual Vanos BMW V8 using our M800/880 series of Engine Management Systems. Special Ref/Sync modes were written to allow the tuner to use the stock trigger wheels and sensors. Camshaft timing can be independently adjusted for each cam in 1/2 degree increments based on RPM and Load. With full adjustment of camshaft opening and closing points, the engine's volumetric efficiency curve can be stretched providing optimum cylinder filling over a much wider range of RPM, increasing the average horsepower and ultimately making the car faster.

Drive by Wire control

MoTeC is the first in the industry to adopt drive by wire throttle control using OE components. Many of the newer models of cars are equipped with electronic throttle control. MoTeC retains all of the standard redundant sensors that the factory uses for safety. In addition to very precise control of the throttle position, throttle by wire also incorporates idle speed control and traction control. MoTeC Drive By Wire is available for certain Bosch, Delphi and Nissan systems using our M800/880 series of Engine Management Systems and we are working on additional Drive By Wire systems on a daily basis. If you are interested, please call to discuss your system's requirements.

Telemetry

All MoTeC products offer the ability to transmit data from the ECU using a 3rd party radio, to a PC using another radio, for real time monitoring of engine functions. The Telemetry option allows the ECU to transmit this data over the radio's and MoTeC's Telemetry Monitor software allows the tuner to view the data remotely. Note that Telemetry is for real time analysis only. No data storage is done on the PC, however the ECU will still be able to log the data.

Remote Logging

When used in conjunction with the MoTeC Telemetry option, remote logging allows the data which is monitored with Telemetry Monitor, to be stored on the PC and converted to a data format which is readable using MoTeC Interpreter, our data analysis software. Note that the Telemetry option must be enabled in order for Remote Logging to function.

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MOTEC T-SHIRT 68

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